SCHOOL HEALTH ADMINISTRATION

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PUBLISHED BY
Teachers College, Columbia University
NEW YORK CITY
1913

THE HOWARD-GRAY CO., PRINTERS,
NEW YORK CITY

PREFACE

THE problem of this dissertation is to find what American cities are doing for national health and vitality through the agency of the public schools, and how this work may be made more efficient and socially useful in solving our individual and national health problems. The scope of the work is enormous and necessarily in the nature of a rough survey, rather than an intensive study of a narrow portion of the field. Only one of the newest phases of educational hygiene, medical inspection of schools, has been very thoroughly investigated, and the multiplicity of limitations in this field has made great accuracy impossible. No very conclusive results have been obtained, and the volume is offered merely as a beginning on a new problem, and for its suggestive value in practical administrative improvement.

The investigation began with the practice of such work in the writer's own school when a principal in Minneapolis, and more directly with a study of data collected by the Child Hygiene Department of the Russell Sage Foundation on the health provisions of 1,038 graded school systems under superintendents. It has since broadened into a study of national health and vitality, a survey of educational hygiene in twenty-five of forty cities visited for the purpose, and an intensive study of health problems in one school system by invitation of the Board of Education. The tentative standard plan for the administration of medical inspection as an organic part of the whole of educational hygiene here offered for criticism, is an outgrowth of the last mentioned study. The hope back of the dissertation is, of course, that the health conditions of our nation may be improved.

To prosecute such an investigation requires the co-operation of a great number of individuals. In this case, superintendents, school physicians and nurses, dentists, directors of physical education, members of state and local boards of education, health officers, principals, teachers, school janitors, and business managers, in great numbers, in the twenty-five cities especially, have cheerfully contributed to make the study possible. For their never-failing courtesy and unstinted helpfulness I here publicly give grateful acknowledgment. To Professors George D. Strayer, Edward L. Thorndike, and Henry Suzzallo of Teachers College, Columbia University, and to Doctor Leonard P. Ayres of the Child Hygiene division of the Sage Foundation, the author is much indebted for encouragement and many valuable constructive suggestions. My wife has contributed at every step to make the study possible.

220 W. 120th Street,
New York City,
Sept., 1913.

CONTENTS

TABLES AND FORMS

SCHOOL HEALTH ADMINISTRATION

OUTLINE ABSTRACT

I. GENERAL METHOD OF THINKING

In general, the thought is that before we can say what the public schools are or should be doing for individual and public health we must determine as accurately as possible with present-day statistics what the health needs and problems of individuals and the nation actually are, and how serious the health problem is, compared with other grave problems of life. The public school's share in the responsibilities for public health amelioration is very great, and growing, due to the lack or inefficiency of other institutions for such a purpose, to the admirable conditions of control in a state institution and with compulsory attendance and general community support, and to the fact that such a large share of health mal-adjustment is due to health ignorance, and the lack of adequate health habits and ideals which it is so largely the special function of the public school to replace with positive health qualities. The principal problems of life, whatever they may be, and to be discovered only by a study of life through surveys or any other efficient means, furnish the problems of public education.

II. PART ONE. THE NATIONAL AND SCHOOL HEALTH PROBLEM AND HOW IT IS BEING MET IN SCHOOL AND NATION. (SUMMARIZED AT END OF CHAPTERS TWO AND THREE.)

Health and physical vitality are all-important to the attainment of the goal of life (happiness through social efficiency), but they are being very poorly provided for, since:

A. The *national* health losses are enormous and largely preventable, for:

1. Approximately 1,600,000 of our population *die* each year, 42 per cent, or about 670,000, of reasonably preventable diseases. The economic loss in deaths is approximately a billion dollars.
2. Approximately 3,000,000 persons are constantly seriously *ill* in the United States, largely of preventable diseases; and this occasions an economic loss of about another billion dollars.
3. A very large number of persons suffer from many *minor ailments* which lower their efficiency and cause absence from work, which makes an economic loss of another very large sum.
4. Other nations, such as Sweden and Germany, are succeeding by adequate national and school provisions in lowering the losses much below our own.
5. Competent authorities have estimated in various ways the large *preventability* of these losses by reasonable application of present knowledge.
6. Such preventability can be seen from the effects of such civic improvements as pure water and pure milk supplies.

B. The *school* health losses are enormous and largely preventable, for:

1. Approximately 100,000 children of elementary and high school age die each year in the United States, 65,000 of whom have been during the year enrolled in a public school. Of these 40,000 and perhaps 50,000 are reasonably preventable. Their education has been socially wasted expenditure of energy and money.
2. The illness losses of both teachers and pupils of the public schools are enormous, coming in the form of personal and public financial loss, of lowered vital efficiency and happiness, and of elimination, non-promotion and retardation at school. Tentative guesses at the amount of each of these last three

due to illness as the chief or only factor are: *elimination,* about 12 per cent; *non-promotion,* about 11 per cent; *retardation,* about 10 per cent.

3. The physical defects losses are also enormous and largely preventable. They function largely in causing about: five per cent of *elimination*, six per cent of *non-promotion,* and seven per cent of *retardation.*
4. Combined, the two factors of ill-health and physical defects function largely in causing about: 15 per cent of *elimination,* 16 per cent of *non-promotion,* and 17 per cent of *retardation.*
5. These results are not the only ill-health results, of course, but whenever these are related to the twenty million school children in the United States, the problem of school health stands out as one of the greatest before the public.
6. The studies reviewed for their school health data here are: Strayer's Introductory Survey to the 1910 Report of the U. S. Bureau of Education, Fisher's National Vitality, U. S. Mortality Statistics for 1910, Dr. Keyes' "Progress Through the Grades of City Schools," the studies of Retardation by Ayres, Strayer and Thorndike, Dr. Bachman's report in the New York City School Inquiry of "Promotion, Non-Promotion and Part Time," Supt. Demarest's 1911 Study, the Boston Non-Promotion Study, Supt. Broome's 1911 Study, Supt. Mackey's 1911 Study, Supt. Verplanck's 1911 Study, Supt. Brubacher's 1911 Study, the Newark Quarantine and Absence Reports, the Ayres, Cornell, and Wallin studies, and a few others.
7. This phase has not been exhaustively studied because the crux of the investigation is the work of the twenty-five cities. Other data to emphasize, by facts, the health problem of schools could easily be furnished and are given in the later study of the *ailments* of school children.

C. The *national provisions for public health,* in the federal, the state, and local governments are comparatively numerous, heterogeneous, and entirely inadequate to meet the national health needs and problems.

Likewise the *school provisions for public health* are numerous, growing, heterogeneous and entirely inadequate, both as to quantity and to efficiency, to solve satisfactorily the school health problem. The science and the practice of educational hygiene are in their infancy.

Many of the agencies and a large number of other facts relating to national, school, and private provisions for public health are concisely stated in chapter three.

Among the most important agencies to work for are: The national, state, and local *departments of health* and their increased scope and greatly improvable (the last two) efficiency, and, secondly, efficient and scientific *departments of Educational Hygiene* in federal, state, and local school systems with the following working divisions: medical inspection, the teaching of hygiene, school sanitation, physical education, and the hygiene of teaching. The promise for the greatest usefulness lies in such departments under expert direction.

III. INVESTIGATION OF EDUCATIONAL HYGIENE IN TWENTY-FIVE CITIES

A. The method was to visit forty cities and select from these twenty-five that had both school doctors and nurses and had had the work in progress for nearly a year or longer. Most of the visits were made in 1911, but for wide acquaintance with the work they have been continued whenever time could be found from the fall of 1910 to the spring of 1913. One city was intensively studied for the Board of Education of that city. All reports, blank forms, the methods of work, and all public provisions for public health in charge of the school or other organizations dealing with school children were studied so far as data could be found and time permitted. The work is in the form of a survey with some intensive study of several phases, and the motive has been to avoid any tendency toward muck-raking and to make the study entirely constructive. The writer was prejudiced against board of health control of medical inspection at the start, and this has been offset by giving these bodies especially favorable consideration throughout.

B. The work of medical inspection is in its infancy and is yet very heterogeneous and inefficient. The organization is poor and the amount of money spent not commensurate with the needs, as compared with other legitimate needs.

C. Board of Health control of this work, even though it has some marked advantages, is, on the whole, less efficient and less promising for the future than Board of Education control.

D. Medical inspection is at present isolated from other phases of educational hygiene. Many promising features of the development of the four other phases of educational hygiene in these cities are given in chapter ten.

E. The chapters on the ailments of school children give a close view of the fifty-four classes of ailments according to the tentative standard classification presented, and attempt to state the probable frequency of such ailments in an elementary school population that has not had long and efficient medical supervision. Our estimates are much lower than those usually given.

F. The reader is here referred to the summary of conclusions regarding medical inspection found in chapter nine, in the tables, and especially in the tentative standard plan for the administration of this work.

IV. TENTATIVE STANDARD PLAN FOR THE ADMINISTRATION OF MEDICAL INSPECTION

A. The plan here offered, and later to be re-printed for separate use, is intended to be applicable as a beginning for most cities, for rural areas, and for any group of small cities. It has been critically tested in part by a committee that has studied the systems of reporting and administration in seventy-five cities, and is believed to be superior to any system now in operation; and may be put into operation at practically the same expenditure of money as any well-provided city on present lines.

B. Every administrative area, a city, a group of cities, or a rural area such as a district, township, or county, depending upon the number of children, should have a director, or supervisor, of (educational) hygiene. Over these, each state should have a supervisor of hygiene. This officer should have the qualifications both of a physician and of a specialist in educational hygiene. Such men are now to be had, and indications point toward the introduction of training courses for doctors of educational hygiene in medical schools and teachers' colleges. The salary at present must be, at least, between two and four thousand dollars a year, of eleven months. The supervisor's function will be to correlate and supervise all phases of hygiene (medical inspection, physical education, school sanitation, the teaching of hygiene, and the hygiene of teaching), in conjunction with the general superintendent, and in many cases to do part of the work of medical inspection. In many systems the number of part-time school physicians, physical training teachers and truant officers who can be eliminated will be great enough to make necessary little or no increase of expenditure for his salary. Many other savings through such a system will be evident.

C. At present, no good plan for the complete elimination of *part-time* work on the part of assistant school physicians has been devised, although this is to be desired. The plan here is to have physicians do practically no other work than that of the (physical) *examination* of pupils, and to have the supervisor of hygiene, where possible, do the work of one physician. To begin with, have one physician, counting the supervisor, for each *three* thousand children, elementary and high school, and one nurse for each *two* thousand children, depending upon circumstances as to the exact numbers. Have the physicians give two hours a day in one school building each, making medical examinations of the pupils (also teachers and janitors) and such individual inspections as are urgent, and completing the examination of the allotted number of pupils, with the help of an assisting nurse, before the end of the school year. The nurses are to do most of the *inspecting*, aside from the routine September room-inspection of all children, and also the home visiting.

D. The details of the work are given in the plan. The reporting and record system should be adapted and adopted, including the tentative standard classification of school ailments. The doctor has no traveling about from school to school on school time to do, and he is likewise freed from making reports. Clerical work is almost entirely placed in the hands of the nurse. This is the greatest piece of economy in the entire plan, when seen in comparison with present systems, many of them requiring far more time at clerical work and inter-school traveling than in actual school medical service.

E. The nurse-alone plan is probably best in very poor districts, unable to provide a complete system. Later, physicians can be added. This is the direct opposite of the usual plan, of employing physicians and then, if possible, adding nurses. The nurse's service is usually cheap, efficient, and directed toward getting the results that count: prevention and cures. So far as *inspection* goes, nurses are able to find most of the serious cases needing care and treatment. We very much need better *training* of nurses for school work, but not any more than we need such training for school physicians. We prophesy that well-trained school nurses will soon take the place of part-time physicians in medical supervision. There will be a supervisor of hygiene with assistants, and physicians in school clinics.

F. The plan as here offered for trial is not guaranteed perfect. It is very imperfect, and nothing will take the place of careful study of local conditions, careful adaptation of this and other plans, and careful training of doctors, nurses, teachers, and pupils in carrying it out efficiently. The skilled medical supervisor will be necessary for this work with any plan, and scientific supervision and study will be sure to bring health results.

EXPERIMENTAL EDUCATION FOR SCHOOL PROBLEMS

"My first and in some respects my deepest impression of the evening spent so enjoyably in Edison's laboratory is not directly connected with the educational value of his motion picture scheme. It is rather of the immense advantage a great commercial enterprise has over the greatest of our existing educational institutions in the matter of conducting systematically an experimental development of a new proposal before putting it into general practice.

"No intimation was given of the sum of money that is being put into the development of this new undertaking. But it is clear that a large staff is employed to develop 'scenarios,' to make suggestions and criticisms, and to try out various schemes, in addition to the expense involved in taking the pitcures themselves. A large sum of money will have been spent before pecuniary returns begin to come in—a good deal of it strictly experimental inquiry.

"Where is there a school system having at command a sum of money with which to investigate and perfect a scheme experimentally, before putting it into general operation? And can we expect continuous and intelligent progress in school matters until the community adopts a method of procedure which is now a commonplace with every great industrial undertaking? Is not the existing method of introducing reforms into education a relic of an empirical cut-and-try method which has been abandoned in all other great organizations? And is not the failure to provide funds so that experts may work out projects in advance a pennywise and poundfoolish performance?"—John Dewey, in the Survey for September 6, 1913.

PART ONE

THE NATIONAL AND SCHOOL HEALTH PROBLEM AND HOW IT IS BEING MET

THE NATIONAL HEALTH PROBLEM

"In the continental United States with over 90 *million souls probably* 2½ *million children are annually born. When we think of the influence of a single man in this country, of a Harriman, of an Edison, of a William James, the potentiality of these* 2½ *million annually can be dimly conceived as beyond computation. But for better or worse this potentiality is far from being realized. Nearly half a million (one-fifth) of these infants die before they attain the age of one year; and half of all are dead before they reach their twenty-third year—before they have had much chance to affect the world one way or another. However, with only one and a quarter million of the children born each year—destined to play an important part for the nation and humanity we could look with equanimity on the result. But alas! only a small part of this army will be fully effective. On the contrary, of the* 1200 *thousand who reach full maturity each year* 40 *thousand will be ineffective through temporary sickness,* 4 *to* 5 *thousand will be segregated in the care of institutions, unknown thousands will be kept in poverty through mental deficiency, other thousands will be the cause of social disorder and still other thousands will be required to tend and control the weak and unruly. We may estimate at not far from* 100 *thousand, or* 8 *per cent., the number of nonproductive or only slightly productive, and probably this proportion would hold for the* 600 *thousand males considered by themselves."—Davenport, in "Heredity in Relation to Eugenics."*

CHAPTER ONE

THE NATIONAL HEALTH PROBLEM

I. EDUCATION AND PUBLIC HEALTH

HEALTH is the fundamental prerequisite for both individual and social happiness and efficiency. It stands in such intimate and vital relationship to existence itself and to the first law of life, self-preservation, that it must ever be a foremost problem of individual and social policy. The primary business of a sick man is to get well and to stay well; likewise, the primary business of the public and the state is to provide for healthful conditions and healthy lives. Private and social practice which preserves and promotes health and abundant life is, from this standpoint, good; that which contributes to ill-health or race-degeneracy, though it bring forth some of the best of the goods of life, is wrong. Theoretically, at least, everyone will agree with the thought emblazoned in great letters over the stage in *Der Mensch* building at the recent International Hygiene Exhibition at Dresden: No Wealth Is Equal to Thee, O Health.[1]

That a very much larger proportion of people than necessary are not realizing this great eternal value of life, good health, is also a matter of common knowledge. The progress of medical and sanitary science in the last fifty years has brought, one by one, most of the insidious destroyers of life and health into the light of day. These discoveries have not only overturned hoary health traditions, such as the commonly accepted opinion that malaria and yellow fever were caused by "night air" instead of by the bills of certain ubiquitous mosquitoes, but they have followed each other in such rapid succession that health science, known by the few, is today, at least twenty, and in many ways forty, years ahead of common knowledge and general practice.[2] It is the purpose of this chapter to face the health problem of the nation and, so, of the schools, endeavoring to determine something of its nature and extent and the responsibility it places upon public school systems.

Probably the most important scientific studies of public health in America recently are Professor Fisher's "National Vitality"[3] and Flexner's "Medical Education in the United States and Canada"[4]; the first, by the statistical methods evolved by the great life insurance companies, outlining the enormous extent and the tremendous importance of the problem; and the second, by personal visitation and scientific methods, determining the almost criminal inadequacy of many of the present instruments for providing health leaders.[5] In the first is given at length the evidences and facts relating to the improvability of health conditions in this country. Fisher shows the methods by which eighteen experts in various diseases, mortality statistics, and sanitary science determined the ratio of preventability for the ninety different causes of death into which mortality is classified. This ratio is defined as *"the fraction of all deaths which would be avoided if knowledge now existing among well-informed men in the medical profession were actually applied in a reasonable way and to a reasonable extent."*[6] That the ratios thus determined are careful, conservative figures, not implying, for example, any *advance* in medical discoveries nor the *complete* socialization of health knowledge now possessed by the few, an inspection of his table of ratios will quickly show. Most persons, perhaps, would increase many of these ratios, since the race is slowly coming to take the view expressed by Pasteur when he said that *"it is within the power of man to rid himself of every parasitic disease."* We have reason to believe in "the improvability of man," and we know that the first step and condition of such conscious evolution is health and life itself.

II. NATIONAL HEALTH LOSSES

A. In Preventable Deaths

The recently published federal "Mortality Statistics"[7] for the year 1910 show that in the "registration area" of continental United States over eight hundred thousand persons died (805,412). The registration area consists of those states and cities that are conscious enough of their health problems to enforce such recording of deaths as will be accepted by the Census Bureau.[8] This area consists of twenty-two states, counting the District of Columbia (City of Washington) as a state, and forty-three cities in non-registration states, and including about three-fifths of the population of continental United States (53,843,896 out of 92,309,348 or 58.3 per cent).[9] The registration area for *births* is very much smaller.

It is impossible, then, for the people of the United States, as contrasted with several modern nations, to know accurately either the national birth rate or death rate. Comparatively lax enforcement of registration laws in many places makes even the statistics from the registration area underestimates. The statistical death rate of this area for the year 1910 is, however, 15 per 1000 population, the annual average for ten years being about sixteen; and, for the year 1910, 16.1 in registration cities, 14.7 in registration states, 15.9 in cities of registration states, 13.4 in the rural portion of registration states, and 16.9 in the registration cities of other states.[10] Wilcox estimates the *true* average death rate for the United States as 18 a thousand.[11]

Using the ratio of registration-area population to the total population, 58.3 per cent, and the number of deaths occurring in the registration area, 805,412, we can compute the probable death loss for the country. Or, we can find what an average death-rate of fifteen a thousand would mean for the entire population, 92,843,896 (July 1, 1910, estimate). From such computation we get a total death loss to continental United States of 1,392,660. Applying the estimate of Wilcox, 18, we obtain a loss of 1,671,228. Professor Fisher considers 18 as a minimum true rate, and this seems reasonable, so a death loss for 1910 of 1,600,000 seems entirely conservative, and would probably be, too, very near the *average* number of deaths year by year. In other words, *a little less than two per cent of our total population dies each year, and at the exceedingly low median age of* 38.[12] How much of this astounding death loss is unnecessary and *preventable* we shall now try to see.

PREVENTABLE VITAL AND ECONOMIC LOSSES

The average ratio of preventability for these death losses, as computed by Fisher from the combined conservative estimates furnished by the eighteen experts, ranging in eighteen cases from zero for such diseases as epilepsy to 85 per cent preventable for typhoid fever, alcoholism, and puerperal septicemia, is found to be 42.3 per cent.[13] In other words two-fifths of the deaths now occurring in the United States are reasonably preventable or postponable. With the advance of medical science each year this ratio will rise. Even as the above lines were being written, March 22, 1912, word came from the United States Hygienic Laboratory that Director Anderson and Surgeon Goldberger had scientifically demonstrated that the "principal, if not the only, means of spreading typhus fever" was pediculae (head lice), the trouble found more frequently and more commonly in most cities by medical inspectors of schools than any other ailment, with the exception of dental caries.[14]

Applying this figure, 42 per cent, to the estimated number of deaths each year *we get as the number of preventable deaths occurring annually,* 672,000.

What does the *preventable* and unnecessary loss of life of over 670,000 persons in a normal year mean in anguish, illness, and money to the people of the United States? The *psychological* losses of this character, although the most terrible of earth's sorrows, we are as yet unable to estimate. The average family is about four, so, at least, three times as many persons (2,010,000) annually are extremely intimately and seriously affected.

ECONOMIC DEATH LOSSES

Various methods of computing the *economic* losses have been worked out. Doctors Locke and Floyd of the Out-Patient Department of the Boston Consumptives Hospital have recently patiently investigated the economic loss resulting from 500 male consumptives, who had visited the hospital in the last five years.[15] The capitalized value of the earnings cut off by the *deaths* of 244 of the men is computed as about a million and a half dollars, or an average of about $6,164 each.

Professor Fisher's calculated "average economic value of the lives now sacrificed by preventable deaths, using the age distribution of deaths, and the percentages of preventability" is $1700 each.[16]

For the 670,000 preventable deaths in this country in 1910, we should have a financial loss to the nation equal to the product of these two figures (670,000 times $1700) which is $1,139,000,000, considerably over *a billion dollars.*

The accompanying table and summary have been made by condensing the U. S. Mortality Statistics which give 189 causes of death. Table II, given in italics, is here included.

B. National Illness Losses. Vital and Economic

But many are ill for each one who dies. "Few who have not studied the facts realize how common illness is, although we all know it is sufficiently common to make the question '*How are you?*' the ordinary form of salutation." The above mentioned Report of the National Conservation Commission on National Vitality (page 741) furnishes the estimate that in the United States there are constantly *three million persons* on the sick list. It is computed that 750,000 of these cases (in 1907) are those of persons thrown out of employment by their illness. The average earnings, computed as $700 a year, lost each year in this way would then be 750,000 times $700, which is over $500,000,000, *a half billion dollars.*

If we take more recent statistics of annual wages and the present amount of illness, we obtain other figures. Professor Scott Nearing computes from a wide study of our wage statistics in industrial sections "that *half* of the adult

TABLE I.

CAUSES OF DEATH FOR THE REGISTRATION AREA 1910.*

	All Ages.	Children of School Ages. 5 to 9	10 to 14	15 to 19	Total. 5-14	Age group of most deaths
All Causes	805,412	17,943	11,736	19,772	29,679	0- 1
I. *General diseases*	215,692	8,891	4,978	9,770	13,869	25-29
1. Typhoid fever	12,673	684	854	1,681	1,537	20-24
2. Malaria	1,167	58	40	67	98	20-24
3. Small pox	202	6	6	17	12	0- 1
4. Measles	6,598	588	152	112	740	1- 2
5. Scarlet fever	6,255	1,731	442	232	2,173	5- 9
6. Whooping cough	6,146	228	17	10	245	0- 1
7. Diphtheria and croup	11,521	2,938	700	228	3,638	5- 9
8. Influenza	7,774	122	73	119	195	70-74
9. Cholera nostras	536	14	8	7	22	0- 1
10. Dysentery	3,446	47	15	13	62	0- 1
11. Erysipelas	2,442	8	14	35	22	0- 1
12. Other epidemic diseases	198	23	11	3	34	0- 1
13. Purulent infection, etc	1,877	73	62	86	135	0- 1
14. Rabies	64	13	9	6	22	5- 9
15. Tetanus	1,373	162	153	88	315	0- 1
16. Pellagra	368	4	5	12	9	30-34
17. Tuberculosis (of lungs)	73,214	489	1,048	5,166	1,537	25-29
18. Tuberculosis (other)	13,095	933	586	933	1,519	20-34
19. Rickets	455	13	8	4	21	0- 1
20. Syphilis	3,221	24	11	36	35	0- 1
21. Gonococcus infection	197	..	1	17	1	0- 1
22. Cancer and other m. tumors	41,039	83	76	152	3	60-64
23. Other tumors	553	9	4	6	13	65-74
24. Acute articular rheumatism	3,328	327	357	261	684	10-14
25. Diabetes	8,040	144	206	258	350	60-64
26. Leuchemia	864	44	35	39	79	40-55
27. Anemia, chlorosis	2,614	39	40	70	79	60-64
28. Other general diseases	5,014	4	10	67	14	0- 1
II. *Nervous Sys.—Special Sense*	77,991	1,368	889	976	2,257	70-74
29. Encephalitis	761	34	37	39	71	0- 1
30. Meningitis	7,619	683	365	294	1,048	0- 1
31. Spinal cord, other dis	4,101	264	146	130	410	65-69
32. Aploplexy, cereb. hem	39,701	47	46	103	93	70-74
33. Paralysis, without spec. cause	7,756	27	21	29	48	70-74
34. Epilepsy	2,287	79	118	172	197	25-29
35. Convulsions (nonpeuperal)	200	54	9	18	63	5- 9
36. Chorea, St. Vitus Dance	123	13	18	41	31	15-19
37. Nervous system, other D	2,069	70	58	63	128	50-54
38. Ear diseases	967	92	64	46	156	Under1
III. *Circulatory System*	100,106	999	1,319	1,447	2,318	65-69
39. Pericarditis	650	32	32	14	64	65-69
40. Endocarditis, acute	4,792	203	226	196	429	55-59
41. Organic D. of the heart	76,178	716	1,011	1,158	1,727	70-74
42. Angina pectoris	3,869	7	12	17	19	65-69
43. Embolism and thrombosis	1,990	20	19	33	39	65-69
44. Lymphatic system, Dis	255	14	9	9	23	0- 1
IV. *Respiratory System*	100,835	2,035	956	1,517	299	0- 1
45. Nasal fossae Disease	135	9	9	5	14	0- 1
46. Larynx, Dis. of	746	90	13	11	103	0- 1
47. Bronchitis, acute	7,229	90	21	21	111	75-79
48. Bronchitis, chronic	5,391	62	30	36	92	75-79
49. Bronchopneumonia	25,337	522	148	158	670	0- 1
50. Pneumonia	54,187	1,138	664	1,140	1,802	0- 1
51. Pleurisy	2,150	66	32	83	98	60-64
52. Pulmonary cong't'n, P. Ap	24,499	28	17	17	45	0- 1
53. Other D. of Resp. System	1,174	16	13	28	29	0- 1
V. *Digestive System*	104,801	1,669	1,270	1,429	2,939	0- 1
54. Mouth and annexa, D	423	11	4	6	15	0- 1
55. Pharynx	840	123	51	40	174	5- 9
56. Ulcer of stomach	2,203	13	18	47	31	45-49
57. Other D. of stomach (not c)	8,403	116	57	73	173	0- 1
58. Diarrhea and enteritis	63,180	469	132	91	601	0- 1
59. Appendicitis and typhlitis	6,128	571	718	754	1,289	15-18
56. Hernia	2,192	8	6	21	14	65-69
57. Intestinal obstruction	4,486	127	88	117	215	0- 1
58. Other diseases of the Intest.	1,571	25	20	22	45	0- 1

*Condensed from the table giving 189 different causes.

TABLE I.—*Continued.*

59. Cirrhosis of liver..........	7,485	15	16	25	31	50-54
60. Other diseases of liver.....	3,092	36	35	34	71	60-64
61. Peritonitis (nonpuep)......	2,419	132	109	162	241	20-24
62. Other D. of digestive system	329	9	4	7	13	50-54
VI. *Genito-urinary Sys. Nonv*	62,559	509	447	780	956	70-74
63. Nephritis acute	5,665	253	165	199	418	40-44
64. Bright's disease	47,665	224	263	440	487	70-74
65. Kidneys, other D. of	1,389	22	6	16	28	0- 1
66. Other D. of uterus.........	774	1	5	29	6	25-29
67. Salpingitis, and other F. D.	1,298	1	2	75	3	25-29
VII. *The pueperal state*.......	8,455	..	11	620	11	25-29
VIII. *Skin and cellular tissue.*	3,008	26	14	31	40	0- 1
68. Gangrene	1,748	10	7	8	17	75-79
69. Abscess, acute	506	12	5	9	17	0- 1
IX. *Bones and locomotion organs*	1,317	100	95	89	195	0- v
70. Bones, not T. B...........	1,145	93	90	81	183	0- 1
71. Joints, not T. B. or Rheum.	119	6	4	5	10	35-39
X. *Malformations*	7,998	76	36	20	112	0- 1
72. Hydrocephalus	685	30	11	4	41	0- 1
73. Congen. M. of heart.......	4,821	33	25	13	55	0- 1
XI. *Early Infancy*	..	..	..	..	..	0- 1
XII. *Old age*	..	..	..	..	..	80-84
XIII. *External Causes*	57,196	2,193	1,678	3,024	3,871	25-30
74. Suicide	8,590	1	31	326	32	35-39
75. Accidental or undefined....	45,416	2,161	1,599	2,525	3,760	20-24
XIV. *Ill Defined Diseases*......	12,462	74	43	68	117	75-79

males of the United States (at least east of the Rockies and north of the Mason and Dixon line) are earning less than $500 a year; that three-quarters of them are earning less than $600 annually; that nine-tenths are receiving less than $800 a year, while less than ten per cent receive more than that figure."[17] $550 or $600 would then be, perhaps, a more characteristic figure than the $700 taken by Fisher. However, considering the increase in average number of illnesses since 1907 and the conservative character of the findings, we may let the annual potential-earnings-loss through illness stand as *five hundred million dollars.*

The Nearing wage statistics, in the light of the computed minimum standards of living, will be found useful later on in throwing light on the cause of malnutrition and other ailments of school children and the necessity of free treatments of children in school clinics.

The Locke and Floyd investigations, above referred to, show that, of the 500 male consumptive cases (41 per cent between the ages of twenty and thirty-nine), by May 1, 1911, the date of the investigation, the 244 *dead* men had lost an average of 58.03 weeks of work from the onset of their disease until death. Their average weekly wages had been $11.89 and their total loss was, therefore, $170,965. The 256 living cases had lost an average of 89.3 weeks of work at an average wage of $11.38, a combined loss of $255,074, making a total loss in wages alone to the five hundred men of $426,039, an average of $852 each.

ECONOMIC LOSSES IN MEDICAL CARE

But lost *wages* are not the only illness losses. There is the further *expenditure for medical attendance, medicine, nursing, etc.* These five hundred sick men selected at random, cost the city of Boston in public hospital and other institutional care $73,984. This is exclusive of large sums spent by private organizations on 406 out of the 500 cases. This makes the loss of wages and cost of medical care at least $500,023 plainly accounted for. With the first item of *loss-of-potential-earnings through preventable death* of the 244 men, we have a total economic loss of about $2,000,000; and 256 cases were not yet ended by death or cured.

The first group lost in wages $618.28 in a year of 52 weeks; the second group lost $591.76 in the same time. So we could say that the *annual* loss in *wages* for these men was on the average $600. The total number of weeks lost by both groups was 37,020, an average of 74 each. In a year of 52 weeks of this time, their cost to the municipality of Boston was about 52/74 of $73,984, or $51,988. This is an average cost for each man of over *a hundred dollars a year* ($103.97, practically $104).

The cost in care to the *relatives* of these men and the cost to *private* philanthropic institutions is not given.

"*The cost per day or year of other illnesses than tuberculosis is presumably greater,* and also the cost per day for other classes is higher than for the poor."[18] Applying to the three million and more persons constantly ill in the United States this partial annual cost to public institutions of $100 for each consumptive, we have a total annual loss for public care of $300,000,000.

OTHER ESTIMATES

A second estimate for total illness expenses to the consumptive poor, set at $1.50 a day by Dr. Biggs of New York, applied to the three million persons constantly ill, gives a total of *a billion and a half dollars.*

Another estimate is based upon an investigation by the United States Department of Labor of five thousand *workingmen's* families. Their average expenditure for illness and death amounted to $27 a year. For the more than eighteen million families in the country this estimate, more than conservative for *all* classes, would make over $486,000,000. The three estimates, the first and last very painstakingly made, are:

$300,000,000 estimate for public institutional care of sick.

$500,000,000 estimate for total cost of illness.

$486,000,000 estimate for cost to all families.

The first and last give only very *partial* costs. It would seem, then, that $500,000,000 would be a very conservative estimate of the actual cost of illness care for the people of the United States each year.

Adding together, finally, the capitalized earning power of the workers *dying* from preventable diseases and accidents each year, *over a billion dollars,* the annual *idleness loss* enforced by serious illness of over *five hundred million dollars,* and the cost of institutional and private *care of the sick* amounting to more than another *five hundred million dollars* and we have *a total annual loss to this country and its people of over two billion dollars,* certainly a sum of sufficient proportions to warrant the most serious consideration of public health measures by all citizens.

In terms of direct or indirect illhealth losses (some form of taxation) it means for each *family* a loss considerably *over a hundred dollars a year.* (For eighteen million families, $111 each.) And this, in the light of the Nearing efficiency wage statistics, means about *twenty per cent, or more, of the median family income.* When a majority of a people, already near or below a satisfactory standard of living, are forced to throw away such a large proportion of their meager incomes and to render up so many victims to health ignorance we evidently have a national problem which should receive first attention and speedy solution everywhere.

C. Losses Due to Minor Ailments, Physical Defects, Undue Fatigue, and Generally Lowered Efficiency

The morbidity losses above computed are those of deaths and relatively acute and serious illnesses. These are all that *curative* medicine has to any considerable extent so far recognized. Modern and future *preventive* medicine will look more and more to incipient and beginning diseases. The vicious sequences, like undue fatigue, then "bad cold," then consumption, and finally death, are entirely too frequent for a schooled and civilized people. Different estimates by competent observers[19] show that on the average for "well" persons from three to five days are lost each year because of such indispositions as indigestion, sick headache, toothache, neurasthenia, and bad colds.[02] That most of these are easily preventable losses a host of competent witnesses give assurance. Doctor Luther H. Gulick, for example, says that "something like *nine-tenths* of all the minor ailments that we have, and which constitute the chief source of decreasing our daily efficiency, could be removed by careful attention." And further, "With the removal of nine-tenths of our disabilities and the conservation and further development of our natural powers the average person can increase his efficiency 100 per cent, that is, he can be twice as effective. This does not refer to doing merely or mainly twice as much work, of course, but by making less mistakes, and by working at a higher degree of speed when he does his work."

We shall not attempt to compute in financial terms these widespread losses of efficiency from *minor* ailments.

They constitute a large part of the general unnecessary health losses of the nation. These great and serious problems of the nation are the first problems of its institutions. In the case of the health problem we have a universal need which, because of its foundation in ignorance, is peculiarly the problem of the public school, the fundamental agency of social improvement and reform. Legislative changes bringing to families pure water, light, air and foods, or better incomes and hours of labor, or better protection from disease germs—all these wait on the generation with more adequate health knowledge, health habits, and health responsiveness. Better health *knowledge,* better health *habits,* and greater *sensitiveness* to bad health conditions must come very largely with the children from the public schools. What the health problem means to the schools themselves let us now inquire.

Complete references at end of Chapter Two.

CHAPTER TWO

THE SCHOOL HEALTH PROBLEM

PREVENTABLE SCHOOL LOSSES, VITAL AND ECONOMIC

I. Death Losses

THE death losses of the boys and girls of the public schools, are, in the light of their preventability, appalling. The 1910 Mortality Statistics show that in the registration area alone a total of about fifty thousand children, between the ages of five and nineteen inclusive, died during the year. Very few cities in the United States give separate statistics of the deaths of school children. Children eliminated by death have received little more attention or study in the past than those retarded or eliminated by illness and other causes. So neither the Census Bureau nor the Bureau of Education have the facts. An approximate computation may, however, be made.

In the age group, 5 to 9 years, in 1910 there died in the registration area 17,943 children (2.2 per cent of all deaths); in the 10 to 14 years' group, 11,736 children died (1.5 per cent); and in the 15 to 19 years' group there was a death loss of 19,772, or 2.5 per cent of the total number of deaths of all ages. (I have been unable to get the number dying at each year of life.) For the 5 to 14 years' group the total is approximately *thirty thousand* (29,679); and for the 5 to 19 years' group the total is about *fifty thousand* (49,451). Most school children will, of course, be found in the first group, 5 to 14, although many will be found in the second group because of the higher deathrate, and the number in secondary schools.

Calculated as was the total number of deaths in the United States, we find that the deaths between the ages five and nineteen would be 6.2 per cent (sum of the above percentages) of the total number of deaths in continental United States (1,600,000), or practically *a hundred thousand* (99,200).

Not all these children were enrolled school children. Dr. G. D. Strayer's "Introductory Survey" to the 1910 report of the Commissioner of Education shows that in the school year, 1908-9, more than seventy (72.22) per cent of the children between the ages 5 and 18 inclusive were enrolled in the "*common* schools." This does not, however, take in the nineteen-year group included above, nor the private school enrollment.

72.22 per cent of 99,200 is 71,642. Deducting very liberally for the nineteen-year group, by methods largely estimations, we should say that, at the very least, 65,000 of the children enrolled in the public schools died during the calendar year.

TABLE III.

SHOWING THE PREVENTABILITY OF DEATHS OF CHILDREN OF ELEMENTARY SCHOOL AGE, 5-14, FOR 25 MOST NUMEROUS CAUSES OF DEATH, 1910

Causes of Deaths.	No. deaths in registration area.	Per cent Preventable.	Total No. deaths in the U. S.	No. Preventable deaths.
1. Accidents	3,760	..	6,300	....
2. Diphtheria and croup	3,638	70	6,200	4,340
3. Scarlet fever	2,173	50	3,700	1,850
4. Pneumonia	1,802	45	3,050	1,370
5. Heart, organic disease	1,727	25	3,000	750
6. Typhoid fever	1,537	85	2,600	2,210
7. Tuberculosis of lungs	1,537	75	2,600	1,950
8. Tuberculosis, other	1,519	75	2,560	1,920
9. Appendicitis	1,218	50	2,160	1,080
10. Meningitis	1,048	70	1,600	1,120
11. Measles	740	40	1,250	500
12. Rheumatism, articular	684	10	1,150	116
13. Broncho-pneumonia	670	50	1,140	570
14. Diarrhea and enteritis	601	60	1,020	612
15. Bright's disease, kidneys	487	40	820	328
16. Endocarditis, heart	429	25	730	182
17. Nephritis, acute, kidneys	418	30	700	210
18. Spinal cord, others	410	..	690	....
19. Diabetes	350	10	500	60
20. Tetanus, lockjaw	315	80	530	424
21. Whooping cough	245	40	410	164
22. Peritonitis	241	55	400	220
23. Intestinal obstruction	215	25	390	97
24. Epilepsy	197	..	330	....
25. Influenza, grippe	195	50	330	82
	26,227	67*	44,270**	20,155

Total number of deaths, 5-14, in registration area, 29,679.
Total number of deaths, 5-14, in the U. S., about 50,000.
Total number deaths preventable, about 33,500. Based upon 1910 U. S. Mortality Statistics and Fisher's Preventability Tables.

*Fisher's average. **Estimated.

TABLE IV.

SHOWING THE PREVENTABILITY OF DEATHS OF CHILDREN OF HIGH SCHOOL AGE, 15-19, FOR 25 MOST NUMEROUS CAUSES OF DEATH IN 1910.

Causes of Deaths.	No. deaths in registration area.	Per cent Preventable.	Total No. deaths in the U. S.	No. Preventable deaths.
1. Pulmonary Tuberculosis	5,166	75	8,650	6,487
2. Accidents and undefined......	2,525	..	4,230	....
3. Typhoid Fever	1,681	85	2,830	2,405
4. Heart Disease, Organic.......	1,158	25	1,940	485
5. Pneumonia	1,140	45	1,920	864
6. Tuberculosis, other parts.....	933	75	1,750	1,177
7. Appendicitis	754	50	1,270	635
8. Bright's Disease	440	40	740	296
9. Suicide	326	..	550	....
10. Meningitis	294	70	500	350
11. Rheumatism, Articular........	261	10	450	45
12. Diabetes	258	10	450	45
13. Scarlet Fever	232	50	400	200
14. Diphtheria and Croup........	228	70	400	280
15. Nephritis, Acute	199	30	340	102
16. Endocarditis (Heart)	196	25	340	85
17. Epilepsy	172	..	300	....
18. Peritonitis	162	55	280	154
19. Broncho-pneumonia	158	50	280	140
20. Cancer and other tumors......	152	..	260	....
21. Spinal Cord, other Dis........	130	..	220	....
22. Influenza, Grippe	119	50	200	100
23. Intestinal Obstruction........	117	25	200	50
24. Measles	112	40	190	76
25. Apoplexy, Cerebro. Hem......	103	35	180	63
	17,016	*67	28,780	14,039

*Fisher's average for all causes of death.
Total number of Deaths, 15-19, in Registration Area, 19,772.
Total number of Deaths, 15-19, in the U. S. about 34,000.
Total number of Deaths, 15-19, Preventable, about 24,100. Based upon 1910 U. S. Mortality Statistics and Fisher's Preventability Tables.

PREVENTABILITY, AND ECONOMIC LOSS TO SCHOOLS FROM DEATHS OF SCHOOL CHILDREN

Professor Fisher's ratio of *preventability for childhood,* with the median years 2 to 8, is 67 per cent. The percentage for the children of school age would be considerably higher, not only because of the good means of social control but because of the greater bodily resistance and consequent fewer deaths in the school period as compared with those on either side, older or younger. Seventy per cent would probably be a very low estimate. Seventy per cent of 65,000 is over forty-five thousand (45,500). A truer figure would probably be fifty thousand. For an entirely conservative number of *preventable* deaths of children enrolled in the public schools (not counting private school children) of the United States, let us take *forty thousand* (40,000). This is the annual price we pay in the *deaths* of our school children for inadequate health measures. The two accompanying tables state the facts concretely.

That this is probably a very conservative number future statistics will show. Germany and Sweden have already cut down their death rate for the school ages even more than this.[21]

MONEY LOSSES

The biggest problem of the public schools is to get sufficient *money* to carry on their work. How much have the schools spent in educating these forty thousand children dying of preventable deaths in any one year? Multiplying the average per capita cost of public schools (enrollment basis) of about $23, by this number (23 times 40,000) we have *for one year* a wasted expenditure of $920,000, probably in all about *a million dollars*. The median number of years that these children had been in school was probably *five*. This would make a total annual expenditure by society for which it received no return (in educating pupils who die during school age) amounting to about *five million dollars*. This sum is exceeded by the total annual 1909-10 school expenditures of only four cities in the United States.

A statistical fallacy probably creeps in here similar to that evident in the calculated enormous economic losses due to retardation found so frequently in superintendents' reports and statistical studies.[22] The cost of one pupil one year, due to the economic law of diminishing expense, cannot rigidly be called the per capita expenditure, perhaps. But that there is a very large economic loss to a city through educating children who die before the age of productivity, and that a very large share of it is preventable is indisputable.

II. Illness Losses

A. THEIR EXTENT

As in the case of actual deaths among pupils, very few school systems keep a separate record of absence due to *illness*, and so the actual effect of illness absences as well as lowered pupil efficiency upon retardation and poor school work are unsolved problems. The amount of absence due to illness is enormous and can partially be determined by the number of *exclusions* for contagious diseases, the number of school children, both ill and well, *quarantined* during the school year, and the number *absent voluntarily* because of illness as it may be recorded on the teachers' record books. That at least 50 per cent of such absence is preventable can be judged from the ratio of preventability of deaths for childhood and the fact that much of this loss is due to minor ailments like toothaches and colds.

The general absence from *all* causes can rather accurately be told. Dr. Strayer's statistics mentioned above[23] show that the "average number of days the schools were kept during the year" for all public schools in the United States was 155.3, while the "average number of days attendance by each pupil enrolled" was only 112.6. Although the difference of 43 days does not, for various reasons, accurately show the total average *absence* by pupils, it certainly cannot be very far from at least 22 days absence each, an average attendance of 85 per cent. City schools alone have a longer school year and better attendance, of course. This number (22) applied to the total number of pupils enrolled in 1909-10, 17,506,175 (not counting the estimated 1,498,701 *private* school pupils) gives the total number of days lost in the public schools of the United States through absence, while enrolled, as nearly four hundred million (385,135,850).

The recent Sage Foundation investigation entitled "A Comparative Study of Public School Systems in the Forty-eight States," page 13, shows an average absence ranging from 44.2 per cent in Mississippi to 12.2 per cent in Oregon. The question is as to the amount due to *illness*.

Farr's estimate, used by Fisher, of *two persons constantly seriously ill for each annual death,* applied to the sixty-five thousand deaths of school children would mean a daily-absence through serious *illness* of 135,000 days, or for the school year of 155 days, 20,925,000 days. This estimate does not include absences for *minor* ailments or physical defects.

THE KEYES' INVESTIGATION

Dr. Keyes' study of the "Progress Through the Grades of City Schools" gives the average annual amount of absence incurred by 2,033 pupils in a school system (Hartford, Conn.) with good attendance, as *ten days each,* or 20,330 days in all.[24] He further says that "this loss of time, under the general acceptance and rigid enforcement in the community of the laws requiring constant attendance and prohibiting child labor, is *practically a measure of the amount of illness in all grades from two to eight inclusive.*" Applying this low average loss of ten days annually to the school children of the country, we have an illness loss of ten times eighteen million or 180,000,000 days, about nine times the estimate given above for *serious* illnesses. The attendance laws were probably very much better enforced in this city than is common, and fewer children were out for minor illnesses than is general.

This would probably make the illness loss to the great common schools of the country something like two hundred million days annually. In terms of school years of 155.3 days each this means a loss of schooling equal to considerably over a million school years, 1,290,000. This might be classed as wasted or ineffective expenditure at $23 a year.

Many other relatively inaccurate methods of computing *illness* losses might be used. The need is for more accurate and more general *records.* We shall leave the matter with the probably conservative estimate of an average of two weeks (ten days) for each child in the public schools of the country. This is on the average about *seven per cent of the time.* When we remember how few days of schooling in their lifetime most children get this largely preventable loss due to illness of from four to seven per cent stands forth in all its enormity.

B. ILLNESS LOSS IN RETARDATION, ELIMINATION AND NON-PROMOTION

I. THE PROBLEM

Since the classic studies of retardation by Thorndike,[25] Ayres[26], and Strayer[27] there has been a national agitation over this matter. Our mass education has made necessary a large amount of repeating of grades. Children who have not been able to keep up with the large classes have been left behind, to do the half or whole year's work again. The number of such "repeaters" in any school system is large. For the United States as a whole, the number of children repeating grades each semester of the year, is astounding in size. The number of whole years repeated in any one year, equivalent to the same number of children repeating a whole year's work, must be considerably over a half million (600,000)[28] or about two or three pupils to a school room, the country over. Almost half of our pupils are above "normal age."

Realizing the inaccuracy of all such figures at the present time let us raise also the problem of the effect of *illness* on *retardation*. There are at least three ways in which this retarding effect from illness is felt: the retarding influence of *absence*, especially long absence due to a contagious disease, *for the children ill*, the retarding effect on those *quarantined* or otherwise kept out of school by other school children's quarantine (those in the same house or family), and, third, the effect of *lowered physical vitality* due to illness.

A few school superintendents have said privately that pupils absent from illness "*grow* while they are out and generally make up their work when they get back to school." Dr. Keyes' study of the actual, yearly, individual records of a great many children does not bear out this opinion. He shows (page 54) that pupils losing more time than normal pupils have also more arrests; and lose very much more time on the average than accelerates or honor pupils. The average annual loss in days for 683 arrests was 12.3 days; for 606 normals 10.2 days; for 613 accelerates still less, 9.7 days; and for 131 honor pupils 6.8 days, about half the first sum.

For the longer absences (considered as practically *all* due to illness) we have the same showing. The per cent of children losing *four weeks* or more in some one year is: For arrests, 76.6 per cent; for normals, 68.4 per cent; for accelerates 66.6 per cent; and for honors, 45.3 per cent.

In table 28, Dr. Keyes shows the surprisingly close relationship existing between the number of days schooling lost and the per cent of arrests during the year of loss. The number of days lost increase as follows: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 or more, and the corresponding percentage of arrests in the year of loss increases concomitantly, as follows: 14, 15, 17, 23, 40, 48, 47, 48, 51, 48, 72. This is a correlation of about ninety per cent.

According to this detailed study of the individual, cumulative record cards of pupils, at least *twenty-five per cent* of all pupils are retarded when they are absent for any length of time less than a month. Absences varying from one to two months stay the progress of *fifty per cent* of the absentees; and when the loss amounts to fifty days or more, as in the cases of serious illness or long quarantine, nearly *seventy-five per cent* of all pupils sustaining such absence fail of promotion.

2. DR. BACHMAN'S STUDY OF THE RELATION OF ABSENCE TO NON-PROMOTION

In his investigation entitled "Report Upon Promotion, Non-Promotion and Part Time" as a part of the recent New York City school inquiry, and distributed about the first of March, 1913, Dr. Frank P. Bachman gives the methods and results (pages 63-70) of an attempt to discover the relation of absence from school to non-promotion among 568,612 elementary school pupils for the second term, February to June, 1911. Unfortunately, late entrance to the schools, which is frequent in a city with a large floating population like this, could not, from the data collected, be separated from irregularity of attendance. The effect of such late entrance can be estimated from the data given later for Boston, where 650 of the 8,496 cases of non-promotion, or nearly 8 per cent, were judged to be due to this factor alone.

"Of the 568,612 pupils on register in regular classes June 30, 1911," he says, "382,406, or 67.25 per cent, were absent during the February-June term, 1911, *ten days and less;* 97,512, or 17.15 per cent, *eleven to twenty days;* 39,391, or 6.93 per cent, *twenty-one to thirty days;* 19,297, or 3.39 per cent, *thirty-one to forty days;* and 30,006, or 5.28 per cent, *forty-one days and above.*" (Italics mine and used only to distinguish.)

The following tables are well worth study, but cannot be given here. A very large part of the absence is in the first half of the first grade, especially for long absences. The children of the upper grades have more short absences and very much less long absences. 60.27 per cent of the *one A* grade were absent twenty days and less in this half year and the percentage gradually rises up to the highest, *eight B* grade, where it is 95.17. The average is 84.4 per cent for all grades. But for the long absences of 21 days or more, there were 39.73 per cent of the lowest grade and only 4.83 per cent of the highest, with an average of 15.6 per cent for all grades. The first and second grades have a very large amount of long absence, while the seventh and eighth have comparatively very little, the averages being 23.42 per cent and 8.21 per cent.

What has all this varying and extensive absence for one term to do with the rate of school progress, economy of time, retardation and non-promotion? Dr. Bachman concludes: "Absence is a very large factor in increasing the number of non-promotions, and hence in increasing congestion. With the exception of the 1A grade, absence affected more seriously the rate of promotion in the higher than in the lower grades; and, in all grades, the rate of promotion varies inversely with the amount of absence." (Page 70.)

The average rate of promotion for pupils absent 20 days and less he finds was 92.03 per cent; for those absent more than 20 days the rate was only 70.57 per cent; a difference of 21.46 per cent.

Dr. Bachman does not work out the chances of failure in different grades for the varying amounts of absence, but a good deal of light is thrown on the problem; and his differences by grades in rates of promotion for those above 20 and those below 21, and his table showing the "Per Cent of Decrease in Non-Promotions at Rate of Promotion for Pupils Absent From Zero to Ten Days" (an average of 64.3 per cent) are good substitutes.

All these amounts of absence should be multiplied by two to approximate the *annual* loss in days for this city that year.

We see here that there is a close correlation of amount of absence with the chances of non-promotion, and so of retardation. All we should need to do would be to find this numerically for grades and amounts of time lost, and then the part which ill-health played in causing this absence, in order to isolate and define the force of this health factor. Other factors than absence enter in, of course, but it will not be an impossible problem to compute for a given system or for many what the chances are that a child in a given grade has to pass for various amounts of absence from school.

3. THE TEACHERS-REPORTS METHOD

Another method of investigating the causal relationship between illness and retardation is to have teachers state the cause of each case of failure of promotion. A number of school superintendents have used this method in the last two years. Great care must be taken in using it, for the judgments of teachers frequently are wrong in these matters and plurality and composition of causes come in to complicate the question. However, they do point toward the relative force of different retarding factors.

THE HOBOKEN STUDY

Superintendent A. J. Demarest, of Hoboken, found that

19 per cent of the pupils of the schools had failed of promotion in February, 1911. A study of the probable causes of 1706 of these failures gave the following:

	Pupils
1. Irregular attendance; sickness one of the causes..	297
2. Quarantine of pupils	14
3. Personal illness	65
4. Poor school work by pupils and teachers, transfers, substitutes, etc.	1,066
5. Foreigners, and ignorance of the English language	100
6. Late entrance into school for various reasons.....	91
7. Truancy	3
8. Physical defects: nervous troubles, adenoids, tonsils, vision, etc.	28
9. Early entrance, too young for school work......	19
10. Sluggish mentality and mental defects..........	23
Total	1,706

Personal illness alone (2 and 3) seems to account for less than five per cent of the cases of retardation. We should, however, have to pick out from the first, fourth, sixth and tenth groups those others whom illness quite largely made fail. This would raise the percentage probably to 10 per cent.

THE BOSTON NON-PROMOTION STUDY

Boson made a study of this serious problem for the pupils failing of promotion for the half year ending June, 1910 (School Document 14, 1910, page 26). "The summary of these returns, which follows, is of great interest as revealing the real causes for retardation based upon an actual and individual investigation of a large number of cases for a definite and specific period." This judgment of the school committee is, of course, unsound, for a number of serious causes of non-promotion, and so of retardation, are not here listed. It would be very interesting, indeed, to take up just one other cause of non-promotion along health lines. What effect has the absence of teachers due to illness (not their inefficiency, but the relative inefficiency of the substitutes and changes incident thereto) have upon the amount of non-promotion? The amount of such absence among women teachers of most school systems is enormous and easily ascertained. In general, does the number of failures of the children increase with the amount of absence of their teachers?

"In June, 1910, the total registration in the elementary grades was 809,908. Out of this number, 10.5 per cent (8,496) were retarded, *i.e.,* not permitted to progress to the next grade on the opening of school in September, 1910. A blank form was sent to each principal requesting him to state the reason why each child in this group (8,496) had not been promoted. The following is a summary of the replies received:

Illness (diphtheria, scarlet fever, measles, surgery, etc.)	1,252
Mentally deficient	369
Defective vision	241
Defective hearing	83
Defective speech	53
Deformities	31
Adenoids	13
Nervous	7
Total	2,049
Mentally immature (slow mental development)	2,803
Entered late in the school year	650
Lazy	538
Inattentive	495
Absence caused by truancy, neglect, home work	468
Came from other schools	405
Came recently from foreign countries	331
Promoted on trial at beginning of year	239
Causes unknown	196
Repeated change of schools	181
Miscellaneous	127
Cigarette smokers	14
Total	8,496

No account is taken here of plurality or composition of causes and it seems remarkable that teachers could say so definitely that just one thing caused a pupil's failure of promotion, when undoubtedly in perhaps a majority of cases several causes contributed to the failures. As we have arranged the items of the table, the first eight items are clearly within the scope of medical inspection, with the possible exception of "mentally deficient." Until separate divisions of psychology are formed, however, and then only in very large school systems, we have the item rightly placed. Cigarette smokers are reported by many nurses as a part of their regular duties and a number of other items not among the eight were more or less matters of ill-health and physical defects but could not be ascertained by the teachers. The large nursing staff of the schools was set to work to improve the health conditions of these delayed children, with what results I have not learned.

These eight reported causes applied to 2,049 children of the 8,496. *This is nearly twenty-five per cent* (25%). Bringing in the other health factors in other items of the list, we should probably have much over 30 per cent.

If we were to take the judgments of the teachers and principals of the elementary schools of Boston at their face value, we should have to say that over one-fourth of all retardation in the elementary schools is due to some form of ill-health. But much of this was undoubtedly due to the inefficiency of the teachers and their substitutes, to a poorly adapted curriculum, to lack of proper administrative measures for getting pupils to school and inciting their maximum efforts, to bad home conditions preventing opportunity for study, to lack of ventilation and adequate play and energizing facilities, etc., etc. However, it does show that in the opinion of these persons, and what is undoubtedly true, ill-health, physical defects, deformities, lowered vital efficiency, and the like, do have a serious retarding influence and prevent efficient economy of time in education.

THE MT. VERNON STUDY

Supt. Edwin C. Broome, of Mt. Vernon, N. Y., in his

1911 report, pages 35-38, gives the results of a study made with the help of principals and teachers of the causes of the non-promotion of 562 pupils in June, 1911. The teachers were asked to give the probable causes of the failure of their pupils. They did not, of course, list poor teaching as a cause; neither did they mention the absences of teachers, when pupils were in the not too-efficient hands of substitutes. There were 707 causes given for the non-promotion of 562 pupils that term, so more than one cause was given for several pupils. The table is as follows:

Reasons assigned	Cases	
1. Irregular attendance or late entrance to class	158—	22.3%
2. Lack of physical vitality	18—	2.5%
3. Mental dullness	133—	19.0%
4. Mentally deficient, or abnormal	30—	4.2%
5. Physical defects	14—	2.0%
6. Immaturity (applies to lowest grades)	96—	13.4%
7. Below grade, or conditioned, at entrance to class	125—	17.7%
8. Inability to use English	28—	3.1%
9. Inattention, carelessness, indolence	83—	13.3%
10. Miscellaneous	22—	2.5%
Total	707—	100 %

We can only guess at the amount of the irregular attendance which was due to illness, quarantine, exclusion by doctors and nurses, and the like. Absence is a big causal factor and illness is a factor lying back of much of this. A large part of the first five items would come under the head of bad health conditions. The smallness of the physical defects item may well be questioned because the city did not have physical examinations of the pupils adequately to *locate* the defects, only inspection. A large number of cases of inattention, carelessness and indolence may have been due to such undiscovered defects. If we could say that probably at least 50 children were retarded because of *illness* alone this term, we should have a proportion of nearly *ten* per cent. This can be only an estimate, of course.

THE TRENTON STUDY

Superintendent Ebenezer Mackey, of Trenton, N. J., in his 1911 report, shows, first, the causes of *elimination* from school, second, of *non-promotion*, and, third, of *retardation*, according to this method. Of 2,218 pupils who left school and did not return ("eliminated"), the following causes come within our perview:

CAUSES OF ELIMINATIONS

Withdrew because of poor health........	192, or	8.7%
Withdrew because of sickness in the family	33, or	1.5%
Withdrew because of physical defects.....	9, or	.4%
Withdrew because of death..............	22, or	1.0%
		11.6%

CAUSES OF NON-PROMOTIONS

There were 8,394 pupils promoted during the year and 1,943 not promoted, 1,055 of whom are called repeaters. 1,918 causes are given for these 1,055 repeaters. The following are the causes which concern us here:

1. Ill-health ....122, or 6.3% of the causes
2. Physical defects .... 68, or 3.5% of the causes
3. Dull ....369, or 19.3% of the causes
4. Irregular attendance ....340, or 17.7% of the causes
5. Absent at time of promotion.109, or 5.6% of the causes
6. Immaturity (mostly in the first 3 years)..........133, or 6.8% of the causes

These six of the twenty-one causes given are either directly connected with ill-health or should be studied further from the health standpoint. Undoubtedly back of several of these factors ill-health stands out in some way as a determining cause. There were physical examinations made of most of the elementary children in this city, so the percentage for physical defects must be based upon more definite knowledge than in Mt. Vernon, where they made up less than two per cent of the causes given. If teachers had more accurate knowledge of the health conditions of their children this factor would probably be raised. As it is, ill-health makes up 6.3 per cent of the factors given. Further analysis would probably show that ill-health alone was the cause in about 8 or 10 per cent of the cases. We need further studies along these lines.

Besides studying elimination and non-promotion Superintendent Mackey gives, third, the causes of *retardation, i.e.,* of all the pupils who are below the grades they should normally be in at their respective ages. For 4,184 pupils in the elementary schools who were above normal age for their grades, the following excuses or reasons, among ten given, are offered, page 93 (3,682 mentions of the 10 causes):

1. Sickness ....257, or 7.0% of the causes
2. Physical defects ....219, or 6.0% of the causes
3. Irregular attendance ....550, or 15.0% of the causes
4. Lack of ability.............406, or 11.1% of the causes
5. Lack of application........453, or 12.3% of the causes

All of the last three mentioned causes may refer to pupils many of whom have an ill-health basis for their poor attendance, ability or application. Sickness is at about the same percentage as previously given.

Data from many other cities might be offered. For want of space and time, and because of their relative inaccuracy, we must be content with these few. Until we have more careful health records of children, we can only guess at the influence of illness on school progress.

4. GATHERING-THE-FACTS METHOD

Another method used by superintendents of schools eliminates personal judgments quite largely, but still leaves the difficulty of separating combinations of causes.

THE SOUTH MANCHESTER STUDY

Superintendent F. A. Verplanck, of South Manchester, Conn., in his 1911 report (see also 1912 report, pages 12 to 17) gives the results of a study of elimination and non-promotion, based upon the records of the pupils kept by the schools. Of 188 pupils *eliminated* from the schools, ill-health and death were the causes of 17 and 4 respectively, together making a percentage of 11.2 per cent.

Two hundred forty-one pupils, or 17.4%, were *not promoted.* Of this he writes: "I am confident that the figures would have been still better had it not been for the prevalence of contagious disease, which seriously interfered with the attendance."

The attendance factor is shown by comparing the average number of days attended by those promoted and those not promoted. The schools were in session 186 days, and the *promoted* pupils lost on the average 32 days, while the *non-promoted* pupils lost 52 days, a difference of four weeks, a *month* in favor of the promoted pupils. A very large part of this low attendance of all was due to the epidemics of diphtheria, scarlet fever, and measles, and other forms of *illness.* How much we cannot say.

The physical defects causes given in the report will be offered under that heading later.

ATTENDANCE OFFICERS' REPORTS

Another way to get at the amount of absence due to ill-health is through the reports of attendance officers, given in many superintendents' reports, but in only a few adequately analyzing the causes of non-attendance. In South Manchester, 755 absentees were looked up, with the following results of interest to us here:

Causes of Absences from School, for 755 Pupils.

Personal illness	305, or 40.4%
Illness in the family	57, or 7.8%
	362, or 48.0%

Here we have a proportion of almost 50 per cent due, according to the officer's statement, to ill-health. We have shown that there is a close correlation between absence and failure of promotion. What percentage of the cases of non-promotion in South Manchester were due to the various ill-health factors such as exclusions by medical officers, quarantine of pupils ill and only exposed, actual personal illness, and illness in the family which makes necessary an older child's help at home or the younger ones to stay at home "because mother was sick and could not get them ready," we cannot say. The writer's personal judgment based upon the tables given and other factors in the situation places it at nearly 20 per cent of the non-promoted pupils. There was probably, however, an abnormally large amount of infectious disease in this city during the year.

THE SCHENECTADY TABLE

In the Schenectady report for 1911 Superintendent A. R. Brubacher gives a table, page 53, which potentially might throw some light on this problem. Unfortunately only facts for unpromoted pupils are given, without a control class, or the possibility of comparing the data with promoted pupils, so we can draw no satisfactory conclusions. The total registration was 11,074, of whom 385 failed outright and 263 failed on condition, 648 in all.

For these pupils, all in the elementary schools, we are given the following facts:

Defective sight	58
Defective hearing	43
Absences:	
Because of sickness	457
Because of quarantine	34
Unexcused	99
Absence of 20 or more days	113

These facts are interesting here, but to derive from them any conclusions we should have to have the six items of data for at least the number of:

Pupils promoted unconditionally.
Pupils failing, with a condition.
Pupils failing unconditionally.

To which might well be added the same data for

Pupils promoted, but with a condition.

It is probably true that these figures show abnormal conditions for retarded children in the direction of ill-health. It is significant that 113 of the 648 pupils were absent a month or more (whether of one of the two groups or the other, or of both, and in what proportions, we do not know), which, according to Keyes, would tend to fail over 50 per cent of the number.

5. QUARANTINE ABSENCE AND RETARDATION

Another way of studying the effect of ill-health is to take the children who have been quarantined and see what their chances of promotion are in comparison with other children. No person has yet attempted such a study so far as the writer is aware.

Absence due to quarantine is given in a number of cities. Newark in the 1911 report furnishes the following striking data:

Absence due to quarantine...............	56,517 days
Total absence due to all causes...........	1,055,560 days
Total attendance of all pupils.............	8,890,974 days

Here we see that the attendance is only eight or nine times the amount of absence, and that quarantine absence makes up over 5.3 per cent of the total amount of absence. The *average* length of quarantine for 1,892 pupils given separate mention was over 21 days each.

If statistics were gathered regarding these quarantined pupils in any city and their promotions much light could easily be thrown on the problem.

6. EXCLUSION ABSENCE AND RETARDATION

Many pupils are excluded by physicians and nurses who are not quarantined. The number of days lost is frequently reported. Thus in Philadelphia the exclusions for different ailments caused an average loss ranging from favus with 60 days, or 12 school weeks, and chorea with an average loss of 57 days, over 11 weeks, down to exclusions for lack of cleanliness of one day and pediculosis with an average of three days. The average loss for each ailment was (1910 report of Board of Health) 17 days, or over three weeks.

In the Hoboken 1911 report we find that 383 pupils lost by exclusions 4105 days, an average of nearly 11 days, or over *two weeks,* each. We cannot obtain the median, but we see how serious exclusions are.

These figures show not only what a great factor in absence ill-health is, but point out new fields for the investigation of this serious problem of health in the schools and homes.

NEED OF RIGOROUS INDUCTIVE METHODS

Each of these problems must be solved through intensive and extensive investigation and by persons skilled in inductive thinking and the technique of discovery in educational fields. There are very many difficulties and pitfalls of which the general administrator or investigator is unaware. It may happen, for example, that the illness absentees are a selected group who became ill because of general hereditary or sociological causes, and that these, not so much the absence, are the cause of poor school work. Practically all the fallacies of inductive thinking lie before each one who adds to the science of education, and the school health problem seems to be peculiarly infested with them.

SUMMARY FOR ILLNESS LOSSES

In summing up the case for illness we can give a general quantitative statement of its effect upon elimination, non-promotion and retardation in only the most hypothetical way. Our purpose has been accomplished if the tremendous importance of this source of waste in education has been adequately emphasized, and the necessity for serious, technical investigations of its causes and prevention in each school system has been shown desirable.

Such study will probably show that illness in one form or another, directly or indirectly, but not including physical defects, is responsible, as a single factor, for *nearly twenty-five per cent of absences from school,* for *ten to fifteen per cent of the elimination,* for *ten to twelve per cent of non-promotion, each term,* and for at least *ten per cent of retardation.*

III. School Losses Due to Physical Defects, and Lowered Vital Efficiency

A little more study has been made of the effects of physical defects upon school progress. Dr. L. P. Ayres summarizes these in the 1913 edition of his book on "The Medical Inspection of Schools," Chapter II. In his book on "Laggards in Our Schools," Dr. Ayres develops statistically the conclusion that "in general children suffering from physical defects are found to make 8.8 per cent less progress than do children having no physical defects."

Serious strictures are made by Dr. W. S. Cornell in his book on "Health and Medical Inspection of School Children," pages 387 to 391, on the Ayres' findings, and by the writer in a later chapter, enough, perhaps, entirely to invalidate the quantitative conclusions; but of one thing we are sure, that physical defects do have a serious influence upon school efficiency and school progress, exactly how much we can, at present, only estimate.

DR. WALLIN'S STUDY

A very technical study by Prof. J. E. W. Wallin, on the relation of oral hygiene to mentality, reinforces to some extent these conclusions. A squad of 27 school children in Cleveland, O., were given free dental treatment and hygienic instruction—filling of cavities, cleaning of gums, instruction in the care of teeth, "fletcherizing" of food, etc.—and before, during, and from three to five months after this treatment were given a series of five mental tests to determine whether or not the remedy of these physical defects had produced a corresponding increase in mental power.

"In spite of much individual variation, the results showed a decided gain in every test. The best proof of the benefit, and therefore of the importance of the work, is that, although all the members of the squad were laggards of from one to four years, only one failed of promotion in the term immediately following the treatment. The beneficial effect on general health of the children was noticeable to children, parents, and teachers alike." (*Dental Cosmos* for April and May, 1912. Article on "Experimental Oral Euthenics.")

The conclusiveness of this elaborate investigation is lost, however, because no control squad of pupils was used. If another like class had been given the same treatment with the single exception of the oral hygiene treatment and instruction and real differences found, we might suspect the truth of the conclusion that there is such causal relationship. We may reasonably suppose, however, that had any group of retardates such as these been selected and given special attention reaching into the homes with the help of nurses, with money rewards, with special testing by principal and physician, and with a small class for the teacher—had any similar class been given all this attention with no attention to mouth hygiene, or with the emphasis on some other factor, say deep breathing, or removal of enlarged tonsils and adenoids, or open-window classroom, or personal courtesy even, nearly, if not quite, the same results might have been obtained. That "during the experimental year only one of the 27 pupils failed of promotion," is not surprising, regardless of the oral hygiene. Pragmatically, such findings do good in getting a proper emphasis on certain features of health provision by school officials and others. How much is fact, and how much is the fallacies of plurality and composition of causes no one knows. We may demonstrate that "on the whole . . . the average child improved about 50 per cent in all the tests during the experimental year," but, as the writer points out, there was a "paramount need of testing such a parallel group," and "our knowledge in this field is largely pretense, sham, illusion."

SUPERINTENDENTS' METHODS

Another method of getting an idea of the effect of physical defects on school progress and elimination is the teacher-report and studying-the-facts methods described above under *illness* effects. Looking back over these and a number of other such studies we can draw the following very tentative hypotheses:

Physical defects are probably causal factors in about the following proportions among other causes:

Five per cent of eliminations from school;
Six per cent of non-promotion;
Seven or more per cent of retardation.

A pupil may, of course, miss promotion and still be young for his class, and, so, not retarded. It is the *persistent* "repeaters" who make up a large portion of the retarded.

IV. Summary of Chapters One and Two

The problems of life furnish the problems of education, and one of the most important of these is that of good health. No serious and extended attempt has previously been made by school officials to discover in a comprehensive manner the nature and the importance of this problem of the nation and of the schools.

NATIONAL LOSSES

The national health losses are those of preventable deaths, preventable serious illness, and preventable minor ailments and defects.

Approximately 1,600,000 people in the United States die each year, or nearly two per cent of our population. Our most reliable computations, derived from life insurance records and health experts' estimates, indicate that probably 670,000 of these deaths, or 42 per cent, are reasonably preventable. Conservative and carefully calculated estimates of the national economic losses due to these preventable deaths indicate an annual loss of over a billion dollars.

There are approximately three million persons seriously ill at all times in the United States. The chief national illness losses computable are those of lost wages and private and public care of the sick. These two forms of economic loss, very largely preventable, each amount to about five hundred million dollars annually.

Combined, we have a largely preventable economic loss in deaths and in illness amounting to two billion dollars annually, a sum great enough to cover the land with preventive agencies.

Added to these losses are those due to minor ailments, physical defects, and lowered vital efficiency, largely preventable. These ailments help to lower the working efficiency, cause much absence from daily employment, and are a serious source of expense to a large proportion of our population. Any study of the attendance of teachers in the schools, of workers in the factories and stores, or of day laborers, will point to enormous losses in these fields, decreasing national wealth and increasing race degeneracy.

SCHOOL LOSSES

The principal school losses are in the form of *deaths* of school children, educated for a number of years and dying before the age of productivity, *illness* losses, and losses due to *physical defects* and lowered vital efficiency. Much can be done on this side of eugenics in eliminating these school losses.

Nearly a hundred thousand children of school age *die* in this country each year. Strayer's government report makes possible an estimate of 65,000 deaths of enrolled public school children each year. No estimate is made for those in private schools, but the number is probably near five thousand. Fisher's estimate of preventability of the deaths of children makes possible an estimate of an annual unnecessary death loss of over 40,000 public school children. This is only part of the price we pay for inadequate health measures in home, school, community and nation. The socially ineffective school expenditures for the education of children who die before the age of productivity are enormous but, as yet, uncomputed. Generous health measures in schools may well be justified on this basis alone.

The *illness* losses to the schools are for both teachers and children, but only those for the latter are studied.*

* Professor Terman has made an investigation of the former in a book entitled "The Teacher's Health," Houghton, Mifflin Co.

These illness losses come in the form of economic losses to the school and in personal losses through elimination, non-promotion, retardation, and lowered vital and school efficiency. The chief outward result of school illness is that of non-attendance, and the effect of such absence has been studied in a number of ways, several of which are given, but none of which are conclusive. Tentative suggestions are reached that illness is the chief or only factor in perhaps 10 to 15 per cent of elimination from school, 10 or 12 per cent of non-promotion each term, and at least 10 per cent of retardation. Beyond this, many pupils do poor work and barely pass from term to term because of lowered vitality due to illness past or present.

The school losses due to *physical defects* have also been problems of a number of investigations, but none of these arrives at a quantitative statement which warrants belief. The whole problem is open for investigation. That the losses are large and serious seems quite evident. Physical defects are probably the chief or only factors in about five per cent of the elimination from school, six per cent of non-promotion, and seven per cent of retardation. Careful studies will probably raise these tentative estimates, made here only for the purpose of emphasizing these health problems as an introduction to the later chapters. The lowered vital efficiency due to physical defects of the pupils who barely pass with very low standards from term to term must also be considered in this problem.

Since illness and physical defects frequently go together, their combination in any one pupil or pupils offers a very serious menace to school efficiency, probably causing, as *combined* factors, *almost fifteen per cent of elimination, sixteen per cent of non-promotion, and seventeen per cent of retardation.* When we consider the enormous proportion of the twenty million school children who fall into one or more of these classes, according to the best estimates, the school health problem stands out as one of the acute problems of modern life.

The following chapters will attempt to show what

American cities are doing for the health of the children and the nation; what twenty-five cities are doing in detail with critical consideration of their efforts; and, finally, what probably can be done in the administration of educational hygiene along more effective and economical lines.

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CHAPTER THREE

HOW THE HEALTH PROBLEM IS BEING MET IN SCHOOLS AND NATION

I. PUBLIC HEALTH PROVISIONS

THE emergence of the health problem as one of serious national importance is of recent date. In these few opening years of the twentieth century the gradual increase of health needs and health knowledge has flowered forth in what one writer terms "the renaissance of the physical conscience of the race,"[1] after lying dormant since the time of Pericles. Why health has for so long been a matter of relative unconcern; why a fatalistic attitude not only toward plagues, sweeping off millions of people,[2] but toward sickness and high death-rates in general, has been maintained, is not easily explained. This attitude of the race in its long health-middle-ages, stands out, however, in remarkable contrast both to that of the Greeks, health as a *religion,* and that of the present, health as a *science.* The reverent teaching and practice of sound life and normal physical development in Athens; the ignorant asceticism and plagues of the later periods; and the discovery of the causes of disease and early death with the growing ideal of health as an individual and public duty—these are the three ages of Health. The great number of years does not adequately express the gaps existing between the Olympic games with Hygieia; the Black Death with Simon Stylites; and the present when a German or American soldier is punished for getting an increasing number of diseases and Colonel Gorgas is scientifically overcoming death at Panama.[3]

Among the explanations must be, of course, the general causes of the dark ages; theologic asceticism; the poverty of the masses which made life cheap and perhaps most additions to the living undesired; the tremendous general ignorance, especially of health matters; the open, relatively healthful life of an agricultural people; and the general individualistic form of life and government. The marvellously rapid change in public opinion and practice with regard to health matters is due quite largely to the industrial revolution with its development of factory life, congested business cities, and dependent poverty; to the transformation of preventive and curative medicine and sanitation into relatively exact sciences; the growth of democracy and the altruistic conscience; the consequent rise of public health agencies;[4] the better conditions for adequate social control of health and disease, especially in cities; the great increase of wealth in the hands of a few and the accompanying possibilities of health philanthropy (e.g., the Rockefeller Foundations, the Sage Bureau of Child Hygiene, the Forsythe Dental Dispensary at Boston, and many other private health charities, educational, preventive and curative); the increase in the organs of public opinion and the increased attention of newspapers and magazines to public health instruction; and, finally, and fundamentally, the growth of the public school system in recent years with its unparalleled opportunity for health control of the younger generations and their education as to how to live healthily, happily, and efficiently in the modern world.

DEVELOPMENT OF GENERAL HEALTH AGENCIES

This universal health awakening in progressive nations can be admirably illustrated by the recent rise and rapid growth of public and private organizations for the promotion of more universal health. A plotted curve of such growth in its entirety would show little rise since the times of Harvey and Jenner until about the third quarter of the past century, when it would rise abruptly and continuously and have a still sharper ascent in these opening years of the twentieth century. The first rapid rise shows, quite largely, the *acquisition* of health knowledge; the second the increasing *application* of such knowledge. Public and personal hygiene, in its practice, is yet several decades behind the health knowledge held by the few.[5] President Butler's terse and accurate statement of the situation from the school point of view, well expresses general conditions: "It is not too much to say that health, its preservation and development, is all-controlling in present-day educational *theory,* although it is unfortunately far from being so in *practice.* The chief reason for this discrepancy between the ideal and the real is *simple ignorance.*"[6]

To make private science public health knowledge and practice, is the mission of a great number of new agencies, often starting as private bodies and gradually becoming public institutions, according to a rather universal method of social evolution. Among such private bodies are: The International Congresses on School Hygiene beginning in 1904 at Neuremberg; the American Medical Association; the health foundations endowed by Rockefeller, Sage, Carnegie and others; the Playground Association of America, beginning in 1907; social settlements and Christian associations everywhere; the Congresses of Sanitary Engineers; the Committee of One Hundred on National Vitality; the National Associations for the Study and Prevention of Tuberculosis, for the Conservation of Vision, for Sanitary and Moral Prophylaxis, for the Study and Prevention of Infant Mortality, for the Study of the Feeble Minded; the National School Hygiene Association; the National Consumers League, the National Child Labor Committee, the New York and other bureaus of municipal research,[7] the National Educational Association to same extent since 1900; tenement house commissions, and various health magazines and general magazines with health articles and departments. These and a great many other organizations in this country and abroad are either directly or indirectly working for public health.*

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*G. Stanley Hall gives a list of ninety and more in his "Educational Problems," chapters XI and XII.

One of the most interesting developments has been the efforts of life insurance companies to keep down the death rate of their policyholders. Certain companies[8] distribute free literature on various phases of the preservation of health, hire visiting nurses, and give free annual medical examinations to policyholders. The Lubin Vitagraph Company has even dramatized the idea and is sending over the world films portraying an insurance president saving his company from paying a big death loss at a financial crisis by sending at some expense a bankrupt family South to restore the father's health, and brought to such an attitude by the naive request of the sick man's little boy: "We want the money to make father well now; we won't need it when he gets well."

Some of the other public health movements and agencies are: the municipal, county and state Boards of Health with their rapidly enlarging scope and powers, the latter now more extensive than those of any other division of the public service not excepting the police; the Boards of Education, in response to the needs of the times, similarly widening their community service; the United States Department of Labor with its mortality census bulletins from the Bureau of the Census and other health studies in the field of labor; the Department of Agriculture, working almost entirely in the past for the health of domestic animals rather than the people; the Bureau of Education, which has as yet contributed very little to public health; and the United States Public Health and Marine Hospital Bureau, and several others which, inevitably, will be united into one comprehensive National Department of Health for the more organized and energetic development of health conditions in the entire country, similar to the work of the Department of Agriculture for the health of live-stock.

There has recently been established also the Children's Bureau and placed in the Department of Labor. What is much needed is a great increase in the scope and support of the Bureau of Education, corresponding somewhat with present-day needs and present-day ability in promoting child welfare. Following the rapid development of many private and public instrumentalities for health promotion, a *correlating* movement is setting in which will help to systematize and make more efficient the multitudinous scattered efforts. In America we have yet a long way to go in health provisions to equal the splendid work which Germany and Sweden have been doing for a number of years. (Dr. Irving Fisher says in a private letter: "*Sweden, which has made the greatest progress in Hygiene of any country,* is believed to have done so largely because of the medical investigations of its schools.")

II. SCHOOL PROVISIONS FOR PUBLIC HEALTH

While the health movement is but beginning in the schools very much has already been accomplished in this country and elsewhere. We shall not stop here to review the movement abroad as this has ably been done in a number of books and articles.[9] It seems desirable to preface the special detailed investigation of what school systems are doing for public health in a limited number of cities, with a brief general statement of some of the more prominent features of this recent movement in the schools of our own country.

This investigation began with a study of data gathered by the Child Hygiene Bureau of the Sage Foundation under the direction of Dr. Leonard P. Ayres in the fall of 1910. A number of investigations into this problem then beginning were thus correlated into one comprehensive investigation which would give a bird's-eye view of the field and the general aspects of the movement in the schools. The following questionnaire was printed on a return postal card and sent to every superintendent in the country (1285 in all), and after a second request was made of a number, returns were received from 1038 graded school systems:

Date......................

Have you a system of medical inspection?
Year work was begun ....
Does system cover inspection for contagious diseases?

Are vision and hearing tests made by teachers?
Are vision and hearing tests made by doctors?
Is there full physical examination by doctors?
Is medical inspection administered by Board of Health or Board of Education?
Number of school doctors———— Annual salary————
Number of school nurses———— Annual salary————
Have you dental inspection?———— Is it by dentists?
Do elementary children have regular outdoor recesses?
Are recesses given in all elementary grades?
How many schools are supplied with individual drinking cups?
How many schools have sanitary drinking fountains?
Are moist cloths used for dusting?
Are dust absorbing compounds used for sweeping?
How many schools have vacuum cleaning outfits?
How often are classroom windows washed?
How often are classroom floors swept?
How often are classroom floors washed?
Are adjustable desks in general use?
How often are they adjusted?
Do pupils receive special instruction on alcohol and tobacco?
Do pupils receive special instruction on tuberculosis?
Do pupils receive special instruction on first aid to injured?

Name ....
Place ....

The disadvantages of getting facts by such means is well known and has been further discovered through visits by the writer to a number of the towns replying and checking up reports. Nevertheless, for a general view such as this and covering the entire country, it is the best that can be done in a short time and at reasonable expense; and probably gives a fairly correct general notion of the present status of the health movement in the schools.[10] Some of the main facts discovered by this investigation are here summarized:

1. Of the 1038 cities reporting 443, or 43 per cent, had medical inspection of some kind.
2. The very rapid growth of medical inspection since 1890 is shown by the following series, giving the number of cities having medical inspection systems for each year (duplications where figures are not known or there were no additions): 1, 1, 1, 1, 4, 4, 4, 5, 8, 9, 11, 17, 23, 28, 37, 55, 77, 111, 167, 263, 400, 443. In 1900 eleven cities had such inspection; in 1905 there were 55. The very rapid increase has been since then. Probably at this writing

not far from half of the cities of the country are attempting this work.

3. In 443 cities reporting on this item, 336 had the work administered by Boards of Education and 106 by Boards of Health. Formerly this work was all done by the Boards of Health but by state law and municipal agitation the work is being transferred to Boards of Education and given a larger educational purpose. Not only inspection for contagious diseases, but careful physical examinations once a year, follow-up work, treatment, prevention, and cure are being developed.
4. 405, or 39 per cent, of the 443 cities, report inspection for contagious diseases. It is probably correct to say that practically all cities, however, look out for contagious diseases by inspection.
5. "In no fewer than 552 cities vision and hearing tests are conducted by teachers, and in addition the work is carried on by doctors in 258 cities." The tendency is for this work, required by law in certain states, to go into the hands of the school nurses. As practically applied a single teacher in a school has generally made these tests. The nurse or physical training teacher saves the regular teacher's time by doing such work.
6. Of the 443 cities reporting medical inspection systems 214, about half, have thorough examinations by doctors. The annual physical examination of every child, teacher and janitor in the school system by specially trained nurses and doctors will probably soon become an integral part of all health work in the schools. Life insurance companies are now beginning to offer free medical examinations to save the lives of their policyholders. The State has a greater interest than any private group in the health of its people.
7. The returns showed that there were 1415 school physicians and 415 school nurses employed. While both are sure to increase rapidly in numbers it is the opinion of the writer that the ratio of three to one will shift in the direction of one to three, because of the greater value of the nurse's work in getting cures. Doctors will probably make the more technical parts of the annual physical examination; nurses will assist in this and make inspections and follow-up cases. An increasing number of cities have nurses without doctors.
8. Decayed teeth is the great "people's disease" and are the source of perhaps most ailments. At least fifty per cent of school children suffer from this malady. Only 69 cities have dental inspection by dentists. The number is rapidly increasing, however, and free dental treatment is bound to become as common as free text-books and free schools once fought as "socialistic."
9. Medical supervision of schools, like most other improvements and the very schools themselves, has grown quite largely out of private efforts. We, therefore, find 75 doctors and 21 nurses receiving no pay from the schools. From this the salaries increase to four thousand dollars for one physician and fifteen hundred

dollars for two nurses. The median salary for nurses is about $70 a month and for doctors about $35. Of course, the nurse gives five to forty times as many hours a week as the physician in most cities.

HYGIENE OF THE SCHOOL ROOM.

10. Of the 1038 cities reporting 947 or about 91 per cent have outdoor recesses. There is a bad tendency the other way in northeastern United States.
11. 264 or about 25 per cent of the cities are abolishing the common drinking cup in the schools by the use of individual cups, and in 785, or about 75 per cent, by the installation of sanitary drinking fountains. Cheap, durable, hygienic and easily workable types of such fountains are being developed and they will undoubtedly become as common as blackboards in our schools.
12. In 643, or over 60 per cent, of the cities the old feather duster or dust creator, is being displaced by the damp cloth. Unfortunately the latter requires more effort and constant vigilance is needed to keep up the standard.
13. 894, or about 90 per cent, of the cities reported the use of dust-absorbing compounds for sweeping. Scientific tests are much needed in this field. The writer has seen ten cent oil work better under scientific control than two-dollar oil, sold to unsuspecting but health loving school boards.
14. Cleanliness is perhaps the greatest health virtue. Eleven cities report the *daily!* washing of school floors and the frequency ranges down to 51 cities reporting *never*. The latter attempt to clean the floors with oil, not an impossibility. Once a month to once in three months seems to be the most common frequency.
15. The frequency of floor sweeping gives 813 cities reporting daily, 70 once in three days, and 106 once in four days. From these it ranges off to one city reporting "once in two months." Daily sweeping when there are eighty or more little feet in and out of a single room all day seems to be none too often.
16. The washing of windows varies from "weekly" to "never." The mode is near once in three months.
17. 428 cities report the use of adjustable desks, about 41 per cent. They are adjusted very uniformly. One city reports a daily adjustment, 13 once a year. The modes seem to be "as needed" and once in five months, each term.
18. As to instruction in hygiene, 95 per cent (982) of the cities report the teaching of the effects of alcohol and tobacco; 63 per cent (649) help the children to understand and to combat the great white plague of tuberculosis; and 57 per cent (592) give occasional lessons on first aid to the injured.

Had we the same statistics in each case for ten years ago with which to compare each of these items, remarkable improvement would undoubtedly be shown along most lines.

Any detailed and rigorous investigation of particular cities would show, however, very much yet to be accomplished before the schools are practicing existing health science.

STATE LAWS RELATING TO MEDICAL INSPECTION

Through state legislation, great advance in the work of medical inspection has recently been fostered. Other phases of educational hygiene have also been improved but we shall give here only the main facts regarding this newest phase of hygiene.

According to Ayres,[11] the first state law on medical inspection is credited to Connecticut (1899) and provided for sight and hearing tests by teachers. New Jersey stands first for an all-round scheme of medical inspection in the law of 1903. This act was permissive, however. Massachusetts again stands at the head, as having the first compulsory medical inspection law, in 1906. No state has yet (1913) a state supervisor of educational hygiene.

Up to May, 1911, seven states had mandatory laws; ten had permissive ones; and in two states and the District of Columbia "medical inspection is carried on under regulations promulgated by the boards of health and having the force of law." This legislation has nearly all come about in the last five years, an evidence of the very rapid growth of the movement, and likewise of the spread of public opinion in a democracy. Much of this legislation, like the Massachusetts law of 1906, will need to be amended many times as the movement grows. One prominent physician, for example, writes from a Massachusetts town, "We are compelled by law to employ a physician as medical inspector but we have experimentally proved the nurse-alone plan best." With such a physician for consultation it is quite probable that specially trained school nurses may do most of the work, and the law will need amending to cover this development if it is generally followed.

From Dr. Ayres' pamphlet previously mentioned the following table giving the principal features of state laws and regulations providing for medical inspection has been taken, with the author's kind permission. The five states

PRINCIPAL FEATURES OF STATE LAWS AND REGULATIONS PROVIDING FOR MEDICAL INSPECTION—1911.

No	State.	Date adopted.	Permissive or mandatory.	Adm. by School or Health authorities.	Insp. by doctors for Cont. diseases.	Physical examinations by doctors.	Insp. of teachers, janitors, buildings by doctors.	Sight and hearing tests by teachers.	Normal pupils trained in tests of sight and hearing.	Provision for employment of nurses.	Penalty for violation of law.	Parents compelled to remedy condition discovered.
1.	Connecticut	1907	P	S	X	X	X	..	..	X	..	..
2.	Massachusetts	1906	M	S or H	X	X	X	X	X	..	..	..
3.	New Jersey	1909	M	S	X	X	..	..	..	..	..	X
4.	New York	1910	P	S	..	..	..	..	..	..	..	..
5.	Rhode Island	1911	M	S	X	X	X	X	..	..	..	..
6.	California	1909	P	S	..	..	..	..	..	..	..	..
7.	Colorado	1909	M	S	..	..	..	X	..	..	..	..
8.	District of Columbia	1907	M	H	X	..	X	..	..	..	..	..
9.	Indiana	1911	P	S	X	X	X	X	..	..	X	..
10.	Louisiana	1911	M	S	..	..	..	..	..	..	..	..
11.	Maine	1909	P	S	X	X	X	X	..	..	..	..
12.	Minnesota	1910	M	H	X	X	X	X	X	..	..	..
13.	North Dakota	1911	P	S	..	X	..	..	..	..	..	..
14.	Ohio	1910	P	S	X	..	X	..	..	X	..	..
15.	Pennsylvania	1911	M	S	X	X	X	..	..	X	..	..
16.	Utah	1911	M	S	..	X	..	X	..	..	..	..
17.	Vermont	1910	P	S	X	..	..	..	..	..	..	..
18.	Virginia	1910	P	S	..	..	..	..	..	..	..	..
19.	Washington	1909	P	S	X	..	X	..	..	..	..	..
20.	West Virginia	1911	M	S	X	X	X	..	..	X	..	..

Reprinted from "Medical Inspection Legislation," by L. P. Ayres.

covered by the investigation set forth in the following chapter are placed at the head of the list for easy reference.

The tendency toward mandatory legislation in this matter is worth noticing, as is also the uniformity of opinion that the *Board of Education* should have charge of it. State supervision, encouragement, and correlation are bound to come not only for medical inspection, but for all five divisions of school health provisions.

THE PLAYGROUND MOVEMENT

Recent statistics[12] show the same forward movement of supervised playgrounds. There are at least 332 cities maintaining supervised playgrounds. The 257 cities reporting, employed during the year ending November 1, 1911, 4132 men and women exclusive of caretakers on 1,543 playgrounds, and expended for the work $2,736,506.16. Thirty-six cities employed 377 workers all the year round. In 39 of the 257 cities the playgrounds were administered by school boards. This movement, also, is only about five years old.

III. CONCLUSIONS

In preceding chapters we have attempted to learn the magnitude of the national and school health problem. This chapter is the by-product of an effort to determine how adequately the present national and school health agencies measure up to the health needs. Many agencies and movements have necessarily been omitted, such as the abolition of the common drinking cup in public places in so many states;[13] but we must confess, that, after looking most of them over in the light of the magnitude, complexity, and national character of our health problem, the present agencies seem rather purile and seriously inadequate. We are still quite largely in the volunteer, private stage of health provision evolution.

A great many good movements have been started in many parts of the country; several states and cities seem to be fairly conscious of how much of an effort should be made to stamp out their preventable deaths and lowered vital efficiency in school and out; the National Government seems near to the provision of a national health bureau or department; but on the whole the few fairly adequate state health laws, the few strong city or state health departments, the few school systems to which we can point that seem to comprehend the seriousness of the school health problem and are meeting it adequately; all these simply show us that we have but started on the road toward school and national health and normal physical development. It is a pleasure and inspiration to live in an age of such change and transition toward better things.

The speed and accuracy with which we adjust ourselves to our health needs will undoubtedly depend very much upon how well we *study* our health problem, determining just where it lies in personal, community, state, or national conditions; how adequately we *plan* to meet the need; and how scientifically we *test* the effect our newly devised instruments have upon the conditions we started to ameliorate.

We shall not proceed far in our health provisions until, as Davenport and others have shown, we shall find that a great deal of our ill-health and physical defects are hereditary and that much is brought out or created by bad sociological conditions. The evolutionist, Wallace, asserts that our social system is "rotten from top to bottom," that it produces most of the evils which eugenists would alleviate, and that eugenic reform must wait on social reform. It will be the part of wisdom, I think, to combine both methods of conscious social evolution, hereditary and environmental.

While the general administrative and special technical phases of health provisions in communities and schools are frequently difficult and complex, yet the ends to be reached are not many, and comparatively few hygienic principles are involved.

"When people have pure food, pure water, pure air, and are freed from the dust of houses, streets, and manufacturing industries; when they have good light and abundant sunshine, sanitary houses, barns, and outbuildings; when they are protected from germ-carrying agencies, such as flies, mosquitoes, rats, mice, and all such pests; when they are protected from people who are carriers of disease germs, and taught how to disinfect their homes and communities; when they are taught to work and play, eat and sleep, dress and bathe, according to the laws of health; when they learn to care for their teeth and their eyes, the main problems of hygienic living will be solved and human life relieved of its greatest sources of suffering and disease."

—Fletcher B. Dresslar, Ph.D., Specialist in School Hygiene for the United States Bureau of Education, in his introduction to bulletin 528, on The Fifteenth International Congress on Hygiene and Demography.

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2. Ditman, Education in Preventive Medicine, Columbia University Publications.
3. See 1913 articles in *Scribner's Magazine,* and many other publications.
4. Robert Bruere's article in the March, 1912 number of *Harper's Magazine.*
5. Ditman, above referred to.
6. Quoted by Elkington, in his "Health in the School."
7. Generally to be found listed in the *Survey Magazine.*
8. *Metropolitan,* and a few others. Bulletins are furnished persons requesting them.
9. Books by Stevens, Kelynack, Wood, Crowell, Hogarth, Dresslar, Burks, Gulick and Ayres and the magazines such as *The Child,* and the *Pedagogical Seminary.*
10. Ayres, What American Cities are Doing for the Health of School Children, bulletin of the Sage Foundation, division of Child Hygiene.
11. Ayres, Medical Inspection Legislation, bulletin from above Foundation.
12. *The Playground* Magazine, January, 1912, and later numbers.
13. Dresslar, "School Hygiene," Macmillan.

Burks' "Health and the School," Appleton's.
Davenport, "Heredity in Relation to Eugenics," Holt & Co.
Wallace, "Social Environment and Moral Progress."

OTHER REFERENCES USED

A. Articles in English, French and German in the Transactions of the Second International Congress on School Hygiene.

B. The Annual Reports of the Chief Medical Officer of the Board of Education of England, London, England, 1909-1912.

C. The recent volumes of the National Education Association which is devoting much attention to health matters and has even changed the name of one division from that of Child Study to that of Child *Hygiene*. The 1912 Report has about 30 articles, reports, etc. (173 pp.) devoted to various aspects of Educational Hygiene, a change from little above zero before 1900.

D. Many of the flood of articles, reports, investigations, etc., appearing in current books and periodicals, entirely too numerous to mention.

E. The very valuable and suggestive account of "Typical Health-Teaching Agencies of the United States," Chapter 12, Vol. 1, of the 1912 Report of the Commissioner of Education, by Dr. F. B. Dresslar, Specialist in School Hygiene.

F. Reports of the National School Hygiene Association.

COMPULSORY EDUCATION AND CONTAGIOUS HEALTH

"The human race will be a better race because of the lessons that have been taught us by the child having contagious disease, the backward child, and the physically defective child. Because of these lessons, the youth of the future will attend a school in which health will be contagious instead of disease, in which the playground will be as important as the book, and where pure water, pure air, and abundant sunshine will be rights, and not privileges. He will attend a school in which he will not have to be truant, tuberculous, delinquent, or defective, to get the best and fullest measure of education."—Gulick and Ayres, in "Medical Inspection of Schools."

PART TWO

HOW THE PROBLEM OF EDUCATIONAL HYGIENE IS BEING MET IN TWENTY-FIVE CITIES

TEACHERS OF THE WHOLE CHILD

"The teacher should be held to more rigid requirements in regard to hygiene. Every teacher should be something of a physician. Our indifference to the physical phase of education is suggested by the fact that today a teacher may have passed from the kindergarten and through the university and still not know how to prevent or cure a cold. Not to know something about the preservation of health, to say nothing of the detection of physical defects such as adenoids, enlarged tonsils, bad eyes, faulty heart, weak lungs, etc., is, on the part of the teacher, inexcusable ignorance. A doctor of philosophy with a cold in the head suggests a humorous interpretation of the old doctrine that nature abhors a vacuum."—Howerth, in Education for May, 1907.

CHAPTER IV

GENERAL PHASES OF HEALTH ADMINISTRATION

A. The Investigation.

I. THE PROBLEM

BECAUSE of the tremendous sociological importance of the schools' health functions; because so little, comparatively, is known about what the schools are actually doing for health in a detailed way; and because cities, getting the social contagion of the health movement, are hastily copying the work of other localities without definite standards for the newer health provisions in the schools, it was considered desirable that personal visits be made to a large number of typical cities, and studies made of their administration of educational hygiene, and especially of medical inspection. The problem is too vast for any complete description or evaluation of health provisions by one person in two or three years. Adequately to determine the health *needs,* and to describe and evaluate the *work* of educational hygiene in *one* city is an enormous, but much needed, task. Consequently, only the larger phases can be dealt with, and only one phase, medical inspection, can be dealt with in any detail.

Some of the problems with which the investigation began are as follows:

1. How much does it cost?
2. What are the types of administration and their relative efficiency?
3. Is there better scientific management of medical supervision by Boards of Health or by Boards of Education?
4. What effect has such work on the health of the children?
5. What effect has it upon pupil-efficiency in the schools?
6. What is the relative merit of school nurses and doctors?

7. What are found to be the principal ailments of school children, how may they be classified, and what is their relative frequency?

8. What is the attitude of the public and the physicians to the enlargement of such work?

9. Of all the ailments and defects found how many are actually treated and cured?

10. How great is the need for free treatment, and how are the cities responding?

11. How much preventive work is being done by the cities in the way of play and playgrounds, open air schools, better school ventilation, physical training, education of parents along health lines, school baths and swimming pools, investigations into the health condition of school children, and the like?

These and many other questions, gradually reshaping themselves as the investigations went on, were prominent. Only a few can be satisfactorily answered. Our ignorance of school health is vast and profound. Educators have been engrossed largely with other matters. A partial list of the great host of unsolved problems in this field has been well set forth by Professor Lewis M. Terman in the March (1912) *Popular Science Monthly*. It is significant that there are but two or three chairs of educational hygiene in the universities of this country.

2. THE DATA AND THE METHOD

Those cities were selected for investigation which had both school doctors and nurses and were in the eastern part of the United States. They were located from the Russell Sage Foundation investigation previously mentioned. There were about forty-five such cities that had both school doctors and nurses at or near the beginning of the school year 1910-11. After visiting most of these and several others (forty in all) fifteen were finally eliminated for one reason or another, New York City, Baltimore and Philadelphia because they were too vast to be typical; others because too little definite data could be discovered; others because the work had begun too late in the school year; and still others because either the nurse or physician was employed by private organizations; or the work had just changed over from the Board of Health into the hands of the Board of Education (e. g., Ithaca, N. Y.).

At least one visit, a half day to a week in length, was made to each city, and as many as ten visits were made to certain nearby cities. The time of visiting was in the school years of 1910-11 and 1911-12 and the intervening summer when playground and other such work could be seen. Additional visits have been made in the school year of 1912-13. A weak point of the investigation was the inadequate time for many cities, and the frequent inability to see the various health agencies in actual operation. Where medical inspection was administered by the Boards of Health these agencies were studied as well as the schools, and where several agencies carried on the work all were studied. Board of Health reports from all the cities have been used as well as the United States Mortality Statistics for 1910 and the reports of the United States Bureau of Education. It has been found necessary, also, to study the work of cities having only school doctors, or only school nurses for comparison with the group selected. The experiences of European and other countries have also been drawn upon. The attempt throughout has been to fit the investigation to the actual conditions found, not the facts to a prearranged theory or questionnaire. The heterogeneity of the findings by such a method, for work so new and tentative, beggars description.

Late in the study the writer had the good fortune to be employed by the Board of Education of one of the twenty-five selected cities, probably nearest of all to the city of typical size in this country, to investigate the work of the so-called medical inspection and to report a tentative, standardized plan for reorganization and growth. Full powers were given in the way of calling for the judgments of teachers, principals, physical trainers, physicians and nurses; and for looking into the work. Though the time available was entirely too short, a good deal of fresh light was thus thrown on the general problem.

We shall first take up the work of medical inspection with its display of pathological conditions and consequent *health needs,* in the schools and homes. Later, brief descriptions and evaluations of other phases of educational hygiene of a preventive and development nature will be offered.

3. MEDICAL INSPECTION OF SCHOOLS IN TWENTY-FIVE CITIES

The following tables attempt to display in convenient form some of the main facts about the work of medical inspection in the twenty-five cities. Some general facts relating to the city and the schools, necessary for comprehension of the situation and for later efficiency tests, are given first. Many facts refuse to enter the squares of a statistical table, and foot-notes, description and qualifications are necessary. Even then the data are relatively inaccurate, for many reasons, but chiefly because of the lack of efficient records in practically all cities. When, for example, a medical inspector has been discharged for sending in reports based on nothing more than entering the lower hall of a school and signing his name in a book, some doubt is cast over his and perhaps others' statistics in that city. Further, most of the blank forms for recording the work are, as yet, so poorly devised that it is almost impossible to record or summarize work done, or correlate it with results accomplished. The poor clerks, devoid of medical knowledge, who have to make up a majority of the summaries from such data help to make even more inaccurate the results. Some cities have met the situation by making no annual reports or very meager and inadequate summaries. To get back of this difficulty it was necessary to spend several months in summarizing the daily, weekly or monthly reports of doctors and nurses in a number of cities. The knowledge gained from such work was, however, well worth the tedious labor. The large number of cases probably helps some to cover up many inaccuracies, and the general facts here selected and presented are probably as accurate as can now be obtained. Our hope is that the study will lead to greater efficiency in this field.

B. Correlations With Population of the Cities.

From these statistics it can be seen that the cities and towns studied are scattered over five states and range in size from 7,500 population to 670,583, 1910 census. Within this range are included most of the municipalities of the country so the data of our study can be regarded as fairly typical in this respect. Since the cities are arranged in order of size (Columns 1, 2, 3), questions immediately arise as to the correlation of this increase with the administrative provisions. In the next column (4) it can be seen that as the cities increase in size more and more of them have medical inspection administered by Boards of Health. This may be due to chance, but is more probably due to the fact that when medical inspection began a few years ago it was confined for the most part to the larger cities, and was under the Boards of Health. The 1906 Massachusetts law prevents cities from taking the work, where already begun, out of the hands of the Boards of Health and putting it into the hands of the Boards of Education. The smaller cities, as shown by the column giving the dates when medical inspection was begun, have started the work for the most part since the change of public opinion and state laws have placed the work in the hands of the Boards of Education. In New Bedford and Boston the work is divided, the Boards of Health having the school doctors and the Boards of Education the nurses.

1. SALARIES AND SIZE OF CITY

Only the larger cities have special supervisors of medical inspection, Syracuse under the Board of Health, Jersey City and Newark under the Boards of Education, and Boston with a supervisor employed by each board.* No significant correlation exists between the size of the city and the salary paid either to physicians or nurses. Some small cities pay little and some much; the same is true of the larger ones. The supervisors' salaries tend to increase with

*The Board of Education in Boston has both a general Director of Hygiene and a Supervisor of Nurses.

TABLE V. — GENERAL ADMINISTRATION.

City and State. 1 and 2.	Pop. 1910 census. 3.	Under B. of E. or B. of H. 4	Year medical inspec. began. 5	Year nurses were added. 6	Year of this study 7	School Population. Enrollment. Elem. schools. 8	High schools. 9	Total. 10	Average daily attend-ance. 11	Number of days schools were in session. 12	No. public schools or school buildings. Elem. 13	High. 14	Private and Par. school enroll-ment. 15
1. Summit, N. J.....	7,500	E	'08	'09	'10-11	1,088	137	1,225	900	188	4	1	....
2. Manchester, Conn..	8,00	E	'05	'10	'10-11	1,526	224	1,750	1,473	185	5	1	....
3. Norwood, Mass....	8,014	E	'06	'10	'10-11	1,571	200	2,171	1,708	186	4	1	$600
4. Winchester, Conn..	9,309	E	'10	'10	'10-11	1,505	322	1,827	1,503	193	9	1	30
5. W. Orange, N. J..	10,980	E	'08	'09	'10-11	1,548	306	1,854	1,342	191	6	1	....
6. Montclair, N. J...	21,550	E	'03-10	'09	'10-11	3,255	646	3,901	3,025	183	8	1	400
7. Meriden, Conn....	27,267	E	'10	'10	'10-11	4,157	500	4,657	3,807	180	16	1	aH.1,980
8. Mt. Vernon, N. Y.	30,919	H	'07	'10	'10-11	5,493	777	6,270	4,756	188	9	2	450
9. Newton, Mass.....	39,806	H	'04	'10	'11	5,987	1,249	7,236	6,025	189	14	2	1,799
10. Brockton, Mass...	56,878	E	'08	'09	'10-11	8,259	1,134	9,393	8,115	185	32	1	850
11. Hoboken, N. J....	70,324	E	'09	'10	'10-11	9,789	378	10,167	7,820	193	9	1	2,500
12. Schenectady, N. Y..	72,826	H	'07	'09	'11	10,121	875	10,996	8,521	186	19	1	2,130
13. Waterbury, Conn..	73,141	H	'05	'10	'10-11	12,077	818	12,895	9,907	193	17	1	4,228
14. Yonkers, N. Y....	79,803	E	'05	'09	'10-11	12,562	1,168	13,730	10,948	185	16	2	3,900
15. N. Bedford, Mass..	96,652	EH	'06	'10	'10-11	11,839	559	12,398	9,745	193	30	1	3,759
16. Trenton, N. J....	96,815	E	'09	'10	'10-11	12,774	994	13,768	11,392	196	30	1	4,000
17. Cambridge, Mass..	104,839	H	'94	'08	'10	15,445	1,711	17,156	14,414	189	20	3	aH.4,128
18. Lowell, Mass......	106,294	E	'09	'10	'10	11,438	1,262	12,700	11,210	181	19	1	4,000
19. N. Haven, Conn...	133,605	H	'01	'09	'10	22,475	2,369	24,844	21,181	190	12	1	2,702
20. Syracuse, N. Y....	137,249	H	'06	'09	'10	18,016	2,556	20,572	18,116	192	40	3	1,940
21. Rochester, N. Y...	218,149	H	'06	'09	'10	23,404	2,169	25,573	20,303	186	35	2	12,681
22. Providence, R. I..	224,326	H	'05	'09	'10	31,946	3,014	34,960	25,575	185	40	4	6,155
23. Jersey City, N. J..	267,779	E	'10	'10	'10-11	34,942	1,986	36,928	29,126	194	32	2	5,000
24. Newark, N. J....	347,467	E	'01	'09	'10-11	57,291	2,293	59,584	46,126	191	56	2	5,000
25. Boston, Mass......	670,583	EH	'94	'06	'10	95,970	13,490	109,460	90,891	187	65	14	19,263
	3,919,075					414,478	41,137	455,615	367,989				87,495

a. Inspected. 2. South Manchester, or "Ninth District." E. Board of Education. H. Board of Health.

TABLE V.—GENERAL ADMINISTRATION—*Continued.*

	Total Expenditures. Board of Health.	Board of Education. Current expenses.	Board of Education. Teachers' salaries.	School Physicians. Number.	School Physicians. An. salaries.	School Physicians. Tot. for salaries.	School Nurses. Number.	School Nurses. An. salaries.	School Nurses. Tot. for salaries.	Total for all med. inspection salaries.	Other Expenditures. Car-fare.	Other Expenditures. Printing.	Other Expenditures. Medical supplies.	Tot. expenditures for pub. school medical insp'tion
	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1.	....	$49,120	$32,857	1	$400	$400	1	$700	$700	$1,100	..	..	$9	$1,109
2.	....	43,938	24,526	1	208	208	1	507	507	715	..	..	192	907
3.	....	50,083	31,474	1	200	200	1	600	600	800	7	15	14	836
4.	....	63,453	36,100	1	250	250	1	700	700	950	..	..	100	1,050
5.	....	80,676	47,397	1	1,000	1,000	1	725	725	1,725	..	10	20	1,755
6.	....	237,932	148,969	5	350	1,750	1	750	820	2,570	6	25	70	2,671
7.	....	147,250	74,514	N.3	250	525	1	600	420	945	5	126	32	1,108
8.	....	249,670	137,832	4	350	1,400	1	750	750	2,150	..	..	..	2,150
9.	$24,905	321,698	224,906	6	250	1,500	1	650	650	2,150	10	25	50	2,235
10.	....	265,192	179,649	3	200	400	1	800	800	1,200	50	..	10	1,260
11.	....	371,601	257,576	3	1,000	3,000	1	833	833	3,833	..	..	..	3,833
12.	28,500	305,373	210,958	2	400	800	2	750	1,500	2,300	..	..	55	2,355
13.	....	344,419	195,307	1	1,200	1,200	1	800	800	2,000	..	50	..	2,050
14.	....	507,886	311,430	2	500	1,000	1	800	800	1,800	..	59	151	2,010
15.	60,437	341,814	219,670	8	400	3,200	1	800	800	4,000	..	..	..	4,000
16.	....	396,150	246,917	8	200	1,600	2	700	1,350	2,950	70	75	91	3,166
17.	45,932	535,366	340,484	6	250	1,500	2	708	1,416	2,916	61	20	..	2,997
18.	....	389,324	252,160	9	200	1,800	1	620	620	2,420	10	30	9	2,469
19.	....	660,057	423,686	5	240	1,200	3	600	1,800	3,000	100	20	25	3,145
20.	....	607,788	383,987	11	300	3,800	2	600	1,200	5,000	60	25	18	5,103
21.	70,530	872,105	554,531	12	600	7,200	3	720	2,160	9,360	100	..	10	9,470
22.	63,515	1,042,438	566,821	4	500	2,000	1	675	675	2,675	55	..	32	2,762
23.	....	1,050,450	800,695	13	300	5,100	6	600	3,600	8,700	..	..	..	8,700
24.	....	2,163,315	1,426,188	38	400	10,158	8	750	6,060	16,218	525	511	1,352	20,863
25.	233,977	4,169,969	2,908,710	{ E.2 { H.81	Below 200	E.4,758 H18,500	35 ..	740	26,660	E.31,418 H.18,500	E.408	E. 30	E. 44 H. 64	50,464 ....
		$15,267,067	$10,037,335			$75,628	78		$56,946	$131,395	$1,467	$1,021	$2,348	$138,468

*a*Inspected. *b*Now $500 and 87 M.D.'s. *c*Now 45 nurses. H. Board of Health. E. Board of Education. S. Supervisor. N. Began in Nov.

Montclair Board of Health had one physician at $250 for parochial schools, and the Board of Education paid the nurse $70 for one month in the summer. Cambridge had 5 extra physicians for parochial schools at $100 a year. Lowell had two extra physicians at $200 a year. Syracuse had a director of medical inspection at $800; Jersey City, at $1,500; Newark, at $1,800. At Boston the Board of Education had a general supervisor of hygiene at $3,750, a special physician at $1,008 and a supervisor of nurses at $1,500, while the Board of Health had a supervisor at $2,500. Boston later had 87 physicians at $500 and 46 nurses. Average salaries are sometimes given above.

the size of the city, indicating, perhaps, a recognition of the possibilities of more responsibility if not more work in the larger places (Columns 19 and 20).

2. NUMBER OF DOCTORS AND NURSES

When we come to the *number* of doctors and nurses (Columns 19 and 20), a surprisingly low correlation is found. The numbers by no means increase proportionately with the size of the city or the number of pupils in the school systems. If the first five cities require the entire time of one nurse each, then, taking 1,735, their average enrollment as a trial standard, Boston should have about 63 nurses instead of 34 and Newark 45 instead of eight. Providence would have 20 instead of one. It is evident from these figures that there are as yet no very definite standards established or attained in this field. The writer found the nurse's time well occupied in these smaller cities. Since the problem increases somewhat with the size and congestion of the city it would seem reasonable from this correlation that while the smaller cities may be fairly well supplied with nurses, the larger cities have a woeful insufficiency. However, the number of physicians, the size of the schools and the distances between them are all factors.

There is a closer correlation between the number of *physicians* and the size of the city, than for the nurses. Physicians were the first to be appointed and the cities have been districted largely on the basis of physicians, not nurses. Taking the same average enrollment for the first five cities (1,735) we find that if these small cities each need one physician two hours a day, Boston should have, on this basis, (counting each supervisor as two physicians), 63 physicians instead of 82, Newark 45 instead of 39, and Providence 20 instead of four. It can be seen that most cities have *fewer* physicians than this trial standard calls for.

PHYSICIAN-NURSE UNIT

But the number of physicians employed depends largely upon the number of nurses in the system and, *vice versa,* it may be said; so the *unit* standard should really be the physician-*with*-the-nurse, the physician-nurse unit. Applying again the average-pupil-enrollment standard, Boston would have 63 doctors and 63 nurses, and the other cities proportionate numbers. The *combined* number for Boston would be 126 instead of the present 120, (80+2)+(34+2+2), a very small difference. (Column 47). For Newark the combined number would be 90 instead of 47, (37+8+2); and for Providence 40 instead of five. The combined number based on this standard is given in contrast to the actual combined numbers for each city in columns 46 and 47. The ratio of the actual combined number to the standard number is given in column 48. Glancing down this column (48) we note an increasing falling away from the tentative trial standard number of physicians and nurses until we reach the last city, Boston, (95.47), where a surprisingly close correspondence is reached. The only city having *more* than the standard number is Montclair and its superiority is apparent rather than real, for its physicians visited the schools only *twice* a week instead of five times, and spent, on the average, only about one hour's time to a visit.

THE PHYSICIAN—HOURS A WEEK—NURSE STANDARD

This shows the necessity for a trial standard which will include the number of hours a week the physicians actually spend in the school work. Later a general working standard will be developed which will include the number of *daily visits a year,* and other matters, but for the quick comparison of cities the following plan may be used: Count as a physician-working-unit one who gives five hours a week (an hour a day) to the schools. Rules and regulations are extremely chaotic; and it is difficult in the heterogeneity to learn exactly *how* many hours physicians actually do put in, on the average (See columns 30-32); still column 49 will show approximately on this comparable basis the relative standing of the cities as to numbers of doctors and nurses. At Montclair, for example, the *five* physicians putting in two hours a week are roughly equivalent to *two* physicians giving five hours a week. Adding the nurse

TABLE VI.

	City and State.	Time Employed. Physicians. No. days a week.	Physicians. No. hours a day.	Physicians. Total weekly hours each.	Nurses. No. days a week	Nurses. No. hours a day.	Nurses. Total weekly hours each.	Ratio of M.D.'s time to that of the nurse per ct.	Checks and Records of M.D.'s.	Checks and Records of nurses.	Average Number Enrolled Elementary Pupils for each: M.D.	Average Number Enrolled Elementary Pupils for each: Nurse.
		30	31	32	33	34	35	36	37	38	39	40
1.	Summit, N. J.	5	1 plus	5 plus	5.5	6 plus	33	15	D	D	1,088	1,088
2.	So. Manchester, Conn.	2	2	4	5.5	6 plus	33	12	G	M.D.	1,441	1,441
3.	Norwood, Mass.	Call	.	2	5.	7	35	plus 5	None	D	1,571	1,571
4.	Winchester, Conn.	5	1 plus	5 plus	5.5	7	38	13	G	A	1,505	1,505
5.	W. Orange, N. J.	5	2	10	5.	7	35	28	F	G	1,548	1,548
6.	Montclair, N. J.	2	1 plus	2 plus	5.5	8	40	5	B	B	651	3,255
7.	Meriden, Conn.	5	1	5	5.5	8	42	12	B	B	1,385	4,157
8.	Mt. Vernon, N. Y.	5	1	5	5.	7	35	14	E	G	1,376	5,493
9.	Newton, Mass.	5	1	5	5.5	8	42	12	D	B	998	5,987
10.	Brockton, Mass.	Call	.	2	5.	6 plus	30	plus 1	D	G	2,753	8,259
11.	Hoboken, N. J.	5	2	10	5.5	7	38	13	J	A	3,263	9,789
12.	Schenectady, N. Y.	.	.	2	5.	7	35	plus 1	D	F	5,060	5,060
13.	Waterbury, Conn.	5	3	15	5.5	6	33	45	D	A	12,077	12,077
14.	Yonkers, N. Y.	2	1	2	5.5	7	38	5	D	D	6,281	12,562
15.	New Bedford, Mass.	2	1	2	5.5	7	38	5	D	D	1,479	11,839
16.	Trenton, N. J.	5	1	5	5.5	7	38	13	JD	JD	1,596	6,387
17.	Cambridge, Mass.	5	1	5	5.5	7	38	13	D	B	2,574	E,722
18.	Lowell, Mass.	5	1	5	5.5	7	38	3	D	G	1,271	11,438
19.	New Haven, Conn.	5	1	5	5.	7	35	14	D	D	4,495	7,491
20.	Syracuse, N. Y.	5	1	5	5.5	7	38	13	B	D	*1,800	9,008
21.	Rochester, N. Y.	5	1	5	5.5	7	38	13	IA	G	1,950	7,800
22.	Providence, R. I.	5	1	5	5.5	8	44	11	D	G	7,986	31,946
23.	Jersey City, N. J.	5	1 plus	5 plus	5.5	7	38	13	KIA	KA	2,910	5,820
24.	Newark, N. J.	5	2	10	5.5	8	44	22	KIA	KIMA	1,548	7,160
25.	Boston, Mass.	5	1 plus	5 plus	5.5	7	38	13	KIA	KN	1,199	2,820
	Summary	.	28 plus		134.5	176	936					183,223
	Average	5	1.12 plus		5.4	7 plus	37.4					7,329
	Median	5	1 plus		5.5	7	38					6,000

A. Daily report. B. Weekly. C. Bi-weekly. D. Monthly. E. Bi-monthly. F. Term R. G. Annual R. or book record. I. Signs book. J. Principals R (D). K. Supervised. L. Meet at office at 8.30 A. M. M. Principals keep time. N. Quarterly R. *Not including supervisor.

TABLE VI.—*Continued.*

	AVERAGE NUMBER OF ELEMENTARY SCHOOLS FOR EACH: M.D.	Nurse.	Equated number of school doctors.	AVER. NO. FOR EACH EQUATED M.D., OF ELEMENTARY: School pupils.	Schools.	COMBINED NO. PHYSICIANS HOURS, AND NURSES ON BASIS OF: Actual number.	Aver. for first five cities.	Per c't-age of actual number.	EQUATED COMBINED NO. OF PHY. AND NURSES. Actual	**Per ct. of "needed."	Actual sal. per hour paid M.D.'s weekly hours basis.	Aver. no. of Elem. pupils for each equated doctor and nurse.	Ratio Ratio of tot. cost of Med. Insp. to total for current expenses.	Per capita cost of Med. Insp. for Ent. Elem. pupils.	Per capita cost of Med. Insp. for El. & High School pupils.
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
1.	4	4	1	1,088	4	2	2	100	2	100	$2.00	544	2.2	1.02	.90
2.	4	4	.8	1,800	5	2	2	100	1.8	90	1.50	800	2.0	.62	.56
3.	4	4	.4	3,927	10	2	2	100	1.4	70	2.50	1,122	1.5	.53	.38
4.	9	9	1	1,505	9	2	2	100	2	100	1.25	752	1.6	.69	.57
5.	6	6	2	774	3	2	2	100	3	150	2.50	516	2.0	1.13	.94
6.	2	8	2	1,627	4	6	4	150	3	75	4.75	1,085	1.1	.82	.68
7.	5 plus	16	3	1,385	5 plus	4	4	100	4	100	1.25	1,036	.7	.26	.23
8.	2 plus	9	4	1,496	2 plus	5	6	83	5	83	1.75	1,098	.8	.39	.34
9.	2 plus	14	6	998	2 plus	7	8	87	7	87	1.25	855	.6	.37	.31
10.	10 plus	32	1.2	6,882	11 plus	4	10	40	2.2	20	2.50	3,754	.5	.15	.13
11.	3	9	6	1,631	1.5	4	12	33	7	58	2.50	1,398	1.0	.39	.37
12.	9 plus	9 plus	.08	12,651	21	4	12	33	2.8	20	5.00	3,614	.7	.23	.21
13.	17	17	3	4,025	5 plus	2	14	14	4	28	2.00	3,019	.6	.17	.16
14.	8	16	.8	15,702	20	3	16	18 plus	1.8	11	6.25	6,979	.4	.16	.14
15.	4	30	3.2	3,700	9	9	14	64 plus	4.2	30	5.00	2.818	1.0	.33	.32
16.	4	30	8	1,597	4 —	10	16	63	10	83	1.00	1,277	.8	.24	.20
17.	3 plus	10	6	2,574	3 plus	8	20	40	8	35	1.25	1,930	.5	.19	.11
18.	2 plus	19	9	1,270	2 plus	10	14	71	10	71	1.00	1.143	.6	.21	.19
19.	2 plus	4	5	4,475	2 plus	8	28	28	8	28	1.20	2.809	.4	.14	.12
20.	4	20	12	1,500	3 plus	14	22	63	14	64	1.50	1,286	.8	.28	.24
21.	3	12 —	12	1,950	3 plus	15	30	50	15	50	3.00	1,560	1.0	.40	.37
22.	10	40	4	7,986	10	5	40	12	5	12	2.50	6,389	.2	.08	.07
23.	3 —	16	14	2,495	2 plus	20	42	48	20 plus	50	1.50	1,747	.8	.24	.23
24.	2 —	7	78	1,468	2 —	47	*90	52	86 plus	95 plus	1.00	666	.9	.36	.26
25.	1 —	2	82	1,170	1 —	120	126	95	120 plus	95 plus	1.00	799	.6	.26	.23
				85,176									23.3	9.66	8.26
				3,407									.9	.30	.33
				*1,631									.8	.33	.24

— Minus. *Hoboken the median city. **Comparing columns 46 and 49.

(Column 49) to the physicians we have the equivalent (other things equal) of a working staff of *three* instead of six. While it will be shown later that probably *two hours a day, five days a week* is a more ideal arrangement, "standard" here means only a trial unit of measurement for putting variant facts on a comparable basis. Fractions should be considered as parts of working-units, not of physicians, of course.

Leaving off the decimals, we see what a variety of things the statement that a city "has medical inspection of schools" may mean. (Column 50). Meriden stands at 100 per cent; while Yonkers stands at 11 per cent. Ten times as many hours of medical service were given in the former city (not counting the number of hours, nor daily visits a *year*), and to one-third the number of elementary pupils. Taking the average of the first five cities again as a basis of comparison (2, a physician with a nurse each), and 1735 as the average enrollment, we can see how many physicians and nurses the cities would have were they to keep up to the trial standard set by the first five. *Boston again practically maintains the custom of the small towns.* Other cities coming near to it, after the five used as a standard, are: Meriden and Newark. Counting office assistance in Boston and Newark there would be almost the same proportionate amount of medical inspection units as in the smaller cities. In other words, the two largest cities almost keep up the standard set by the smallest towns while other cities fall considerably below.

The percentage figures in the next column (50) show how nearly the different cities come to the working standard. When we see such large and relatively efficient cities as Newark (95 per cent), and Boston (95 per cent), practically coming up to the standard set by the smallest, and then see Meriden starting out (October, 1910) on an ably constructed plan of administration of this work and practically taking up this standard, it appears that the *working* standard used here must not be far from what actually seems necessary. Its limitations will be shown later. In Summit, for example, with a first-class suburban population the medical inspector really has to put in more than an hour a day five days in the week, and, to get the work well done, should be employed for two hours in actual medical work daily; but in the year studied he made only 125 daily visits in the school year of 188 days.

Interpreted, some of the cases in this column mean, for example, in Rochester and Jersey City,* that these cities have about half (50%) as many inspectors and nurses as would meet the standard of the largest and smallest towns; Yonkers has about 11% as many, being most poorly supplied of all the cities. These figures, then, show the approximate relative standing of the cities as to the amount of medical inspection forces per unit of school enrollment not counting the relative number of weeks employed in a school year. This does not state what *should* be, but what was. The number of nurses put into a school system would influence the number of physicians needed. It is probable that there should be at least an *equal* number, and perhaps more. No data are here given on this problem.

3. BOARDS OF EDUCATION VS. BOARDS OF HEALTH

Is there any light thrown by these comparative figures on the relative efficiency of Boards of Health and Boards of Education? If Boards of Health are more responsive generally to the needs of the schools with respect to pathological health conditions than are Boards of Education then we should expect these figures to show them better manned for the work of medical inspection, especially since they are, on the average, nearly three times as old. What are the facts? Leaving out the two cities, New Bedford and Boston, where the responsibility of caring for the health of the school children is divided between the two

*This was the first complete year of medical "inspection" for Jersey City and the plan was not completely carried out. The rules require two hours a day, five days a week, for each physician. Were the actual average ten hours a week, the combined number would be $12 \times 2 + 4 + 6$. The twelve M. D.'s would be equivalent to twenty-four, the supervisor to four, and the nurses to six; in all, thirty-four, instead of twenty.

boards, we can take the average standing of those cities where this work is administered by Boards of Education and compare it with the average of the cities under Boards of Health (Column 50). The average for the fourteen cities administered by Boards of Education is 76% (omitting Brockton,* 81%) while the average for the nine cities where the work is in the hands of the Boards of Health is a little over 45%. This would seem to indicate that Boards of Health are *not* as responsive, or not as successful, in getting an adequate force of medical inspectors and nurses as are Boards of Education. Even leaving off the first five cities and comparing the nine remaining cities with the nine others, the Boards of Education stand at about 62% while the Boards of Health stand at about 45%.

An alternative, however, remains: That the Boards of Health may be able to *use* more efficiently a given number of medical inspectors and nurses than could the Boards of Education. This remains for later solution when the amounts and quality of work done are compared. It may be said here, however, that in general they seem to use them far less efficiently than do Boards of Education.

Under Boards of Education.		*Under Boards of Health.*	
Montclair	75	Mt. Vernon	83
Meriden	100	Newton	87
Brockton*	20	Schenectady	20
Hoboken	58	Waterbury	28
Yonkers	11	Cambridge	35
Trenton	83	New Haven	28
Lowell	71	Syracuse	64
Jersey City	50	Rochester	50
Newark	95	Providence	12
	563		407
Average, 62%, without Brockton, 67%.		Average, 45%.	

4. TENDENCIES IN MEDICAL SUPERVISION

Without carrying any further the correlations between

*Brockton is exceptional for the reason that it is practically eliminating physicians, using them for consultation by the nurse only. This marks the begininng of a growing tendency.

the increase in size of the cities and their school populations, we can see something of the tremendous heterogeneity and relative status of cities in this work. Another preliminary problem arises as to the *tendencies* shown by these 25 cities. How rapidly is medical supervision coming into our cities, and is its administration going into the hands of the Boards of Education or the Boards of Health? The facts are shown by the following table (Column 5):

Two began Medical Supervision in 1894, both by Board of Health. One now partly Board of Education.

Two began Medical Supervision in 1901, one Health and one Education, formerly Health.

One began Medical Supervision in 1903, Education.

One began Medical Supervision in 1904, Health.

Four began Medical Supervision in 1905, two Health and two Education.

Four began Medical Supervision in 1906, three Health (one partly Education) and one Education.

Two began Medical Supervision in 1907, both Health, one partly Education.

Three began Medical Supervision in 1908, all Education.

Three began Medical Supervision in 1909, all Education.

Three began Medical Supervision in 1910, all Education.

None of the nine cities starting since 1907 has intrusted this work to Boards of Health. The work began with the Boards of Health but it is now being placed in the hands of the Boards of Education. In New Jersey the 1909 law placed all the systems then existing under the Board of Education, four of these cities.

This table for these twenty-five cities corresponds closely to the one made for 1,038 cities given earlier. It shows a very remarkable acceleration since 1904-5, an increase so rapid as to point to the movement spreading soon to all cities. In these cities, too, the *nurses* have all been added since 1906 when Boston started the movement on a large scale, practically all having been added, indeed, since 1908. (Column 6). A tendency, not yet to be shown in figures, exists toward *increasing* the number of nurses and *decreasing* the number of physicians. One city, Brockton, dropped three of its physicians (keeping two paid and one voluntary physician for *consultation* only), and put one nurse in their place. This was at the instance of physicians themselves, one of whom is on the Board of Education.

Newark is now changing to almost the same plan, using a few physicians as district medical supervisors of a large number of nurses. Oakland, Cal., and Albany, N. Y., have the same general plan.

C. WHAT DOES MEDICAL SUPERVISION COST?

a. *Salaries of Supervisors and Office Help*

The salaries of physicians range from $200 to $1,200 as regular examiners or inspectors. One, a member of a Board of Education, gives his services free of charge (at Brockton). The salaries of the head-physicians, or supervisors, range from $800 to $3,780, as follows:

Syracuse, $800.

Jersey City, $1,500.

Newark, $1,800.

Boston: Board of Health, $2,500; Board of Education—General Supervisor Department of Hygiene, $3,780; Supervisor of Nurses, $1,500.

None of these supervisors gave full time to the work, excepting the woman who is supervisor of nurses in Boston. From three to four hours a day was expected or given by the other supervisors. These figures, of course, do not give credit to the large amount of supervising time given either by the superintendents of schools or of boards of health in certain cases. They refer only to those officials who have been definitely set apart for this specific work alone and who are paid a salary for it. Each of these supervisors has office help, either the general office force as in boards of health, or special assistants as in the case of the schools. Jersey City has one stenographer on half time, and here only records of *excluded* children are summarized. In Newark, the supervisor has a well appointed office and two efficient clerks on full time. Even these are not able to do all the work desirable to keeping track of 37 to 38 inspectors and eight nurses with daily reports, a sanitary inspector and large amounts of medical supplies. Analysis of results and adequate checking up and reporting are difficult. In Boston, the school Supervisor of Hygiene and the Supervisor of Nurses have but one clerk. To meet this situation nurses are there required to hand in reports only every three months. Of course, there are no physicians to look after as they are under the direction of the Board of Health. The efficiency of reporting only every three months instead of daily or weekly is very doubtful.

b. *Salaries of School Physicians*

The gross salaries of physicians seem very low. The average salary is $398, practically $400 a year.* The median salary is, however, only about $300, half of the cities having less than this salary and half having more, while only six pay more than $400. The three cities which pay $1,000 and over are exceptional. In two of these, as will be shown later, the salary is probably higher in proportion to services rendered than is necessary. Distinctions must continually be made between the number of hours required by the rules or expected by the Board and the number of hours which are actually given to the school work. These three cities require twice or three times as much time a day as is customary, two and three hours instead of one. Boston had 80 physicians at a dollar or less an hour; for some physicians put in more than the required hour a day. This has since been changed to two hours a day and $500 a year.

A salary of $300 for ten months, counting twenty school days to a month, and a visit of an hour a day, five days in the week, means $30 for 20 hours, or $1.50 a visit,

*Newark has since changed from thirty-seven physicians at $300 a year to thirty-eight physicians at $400, giving strictly two hours to the school work each day since many physicians have but one school. Further changes emphasizing the nurse are now taking place, however. See page 84.

or hour. $400 means $2 an hour. These are not far from the regular charges of average physicians in private practice. The *public* service is far more regular, very few patients indeed requiring a physician's services daily nearly 180 times a year. It, moreover, brings the physician into touch with a great number of present and future citizens, which will, in many cases, increase his practice. The main drawbacks seem to be, *first,* that the school hour, or hours, should be given at practically the same time each day, thus interfering with possible private practice; *second,* that the work is of such a routine character that the physician very soon tires of it; and *third,* that the conscientious physician is frequently disheartened in the attempt to do in an hour, an hour-and-a-half, or even two hours, all that needs to be done in service to the children. To emphasize the second point, Dr. Cornell's frequent mention of the physical strain of prolonged examinations may be quoted from his book on "Health and Medical Inspection of School Children." In speaking of vision testing, page 42, he says: "Anyone who has examined for two hours, alternately standing beside a test card with a pointer and going to a table or desk to make the record, using constantly the eyes, voice, and body, with the added effort of instructing each child clearly what to do and how to do it, will testify to absolute fatigue experienced, as well as the feeling of eye-strain ensuing." And again on page 43, "An hour and a half of eye testing is almost sufficient to start up a headache in any examiner, no matter how perfect his eyesight, and phlegmatic his temperament." These effects are practically universal and are mentioned by most of the English writers on this subject. It would seem that the strictly medical examination, not including vision or hearing tests, is just as fatiguing and that those who claim physicians should be employed for the entire day (excepting the supervisor who could vary his work) as is the teacher or nurse, are wrong; and the best scientific management would make the physician's expert services last little longer than two hours daily. For full-time service the problem becomes one of providing other work for each half day. The nurse, of course, can easily alternate her work with home visiting. It is doubtful if any first-class physicians could be found who would devote their entire days to medical examinations of pupils. All the writer has questioned asserted this emphatically. The ideal for the physician at present would seem to be *two hours a day,* taking no part of the two hours in going from one school to another. Inevitably school physicians will, however, be provided on full time. The problem has not yet been solved. Several very large cities now have full-time physicians, of course, but the salaries are large, and we are looking here more to average or typical cities.

These salaries as printed, however, do not show comparatively what the *real* salaries are. The number of hours a day, week, and year, the quality and the difficulty of the service must all be considered. Leaving out the last two for the present, let us see what the salaries are in terms of *hours spent in the school service.* Columns 32 and 51 give respectively the number of hours a *week* each physician gives on the average, as nearly as could be determined, and what each hour cost the city. The second column then gives fairly accurately the real comparative salaries, omitting the number of daily visits in the school year, which varies greatly. Where cities have no rules governing this matter or have physicians only "on call" estimates have been made, with the help of some supervising official, of the average number of hours a week inspectors spent in the schools. Likewise, where the work is new and the administrative measures not yet perfected estimates have necessarily been used. Some inspectors will perhaps find that their individual amount of time is underestimated by these figures; others, overestimated. Had we facts for all cities the number of daily visits a year should be taken into consideration as an important item. Wholesale absence is common in some cities.

These salaries stated in terms of wages-per-hour range from $1 to $6.25. If it could be shown that the physicians at Yonkers gave an average of more than an hour a day twice a week, then this largest salary would be decreased, and perhaps some other city would stand highest. The facts are for the year 1910-11. The *average* wage per hour for the 25 cities is $2.30 and the *median* wage is $2, half of the cities paying less than this amount and half paying the same or more. Only five cities pay more than $2.50 an hour and only three pay as low as one dollar. If the four cities paying over *three* dollars actually had a larger average number of hours service for each physician, which may be possible, the average and the median for all would not be far from $1.50 an hour. The Newark change from $1.50 to $2 a visit of two hours each, five days a week, is interesting in this connection. Of course, where the calendar, instead of the four-weeks school month, is used, physicians get a little less an hour. It is very doubtful if it is an efficient use of public money to pay more than $1.50 an hour (three dollars for a two-hour visit). If Boston can get 80 physicians year after year, Newark 38, and many other smaller cities can get good average physicians for a dollar an hour, this sum, especially in the two hour a day plan, would seem to be a reasonable minimum. Sixty dollars a month regularly ($1.50 an hour) seems to be average physicians' earnings, much better than many, and better than the teachers in the schools obtain. Where more is paid, say two dollars an hour or $800 a year, diminishing returns bring in the school nurse who can be had on full-time eleven instead of ten months in the year, and who is often more efficient hour by hour for the relatively simple work of school inspection than the physicians.

c. *Nurses' Salaries*

The salaries of nurses are fairly well standardized. Nurses in a large number of schools work from 8:30 or 9:00 in the morning until 4:00 to 6:00 in the afternoon, with a half hour to an hour off for lunch. Generally the plan is to have the nurse at the school about fifteen minutes before school begins in the morning; and to require her to do home visiting after school until five-thirty or a little later. Home visiting may also be done in school hours in many places. On Saturday, the nurse makes home visits from eight or nine to twelve o'clock. For these five-and-half days a week with Saturday afternoons frequently devoted to statistical records and reports, the nurses receive salaries ranging from a little over fifty, to ninety dollars a month, ten, and, in some cases, eleven or twelve months in the year. Boards of health quite regularly, though with exceptions, employ the nurses for twelve months with salaries of eight or nine hundred dollars a year. In the summer and at other times when not engaged in school medical inspection, the Board of Health nurses do the regular district and other nursing.

In Schenectady the nurses each spend a month of the summer in the Open Air School with one month vacation each. In Boston, the school nurses are paid in twelve annual installments and may be called upon for service during the summer vacation, but as yet they have been free. The tendency is toward keeping a part or all of the nurses in relays during the summer (each nurse getting a month's vacation) for the inspection of children in vacation schools and playgrounds and for the home visiting which seems necessary to prevent immense accumulations of cases of pediculosis, impetigo, and the like for the beginning of the school term. The salary of the only head nurse, or supervisor of nurses (in Boston), is $1,500.* She and the other nurses are on a salary schedule which rises with years of experience and growing skill. This latter desirable measure tends to put the nurses on the same professional plane as the teachers. The tendency is for the nurse's salary to be as high as that of the teacher. Her work is perhaps a little longer but on the average her professional training and years of preparatory schooling are much less. Her night work also is probably very much less than that of teachers.

The average salary in the 25 cities is $756 while the median is $750, for ten months. A number of nurses are paid for an extra month in the summer over this sum.

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*More now.

d. *Total for all Medical Supervision Salaries*

The total for all salaries of doctors and nurses is given in column 25. The seeming discrepancy for Newark arises from the fact that until February of the school year, 1910-1911, there were 16 doctors on a salary of $400 a year, ten hours a week; while after that date there were 37 doctors on a salary of $300 a year, ($ .75 an hour) giving the same time.* In three cases, as shown (Montclair, Cambridge, and Lowell), the Boards of Health have employed other physicians to inspect the parochial schools. The physicians of no Board of Education as yet inspect private and parochial schools. The Boards of Health have exercised such rights because their general health powers are so great. Where state laws require medical inspection of parochial schools, the latter are coming to ask boards of education to do it, however.

2. SUPPLIES AND OTHER EXPENDITURES

a. *Carfare.* (*Column* 26.)

As physicians frequently have automobiles or other conveyances, they are not usually given car tickets. The nurses are nearly always given such tickets. In some cases, e.g., the small towns near Boston or New York, railroad fare is also included whenever a nurse takes a pupil or a group of pupils in to a free clinic or specialist. Permission is, of course, granted by the parents for such cases. The median allowance for carfare, so far as it could be discovered, seems to be about thirty-five dollars a year for each nurse. The 35 nurses in Boston required only $408.50 for the year, an average of less than $12.00 each ($11.66); and this sum includes the supervisor who probably spent far more on the average than the other nurses. Where a large city is well districted and there are many nurses, such expenditure, will be, of course, largely reduced.

b. *Printing*

The printing expenditures (Column 27) are for medical supervision blank forms, notices to parents, and the like. Where daily reports are made on printed postal card forms

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*From February 1st, 1912, there have been thirty-eight doctors on a salary of $400 a year each, a rate of about one dollar an hour.

or sent in stamped envelopes, postage becomes a large item. In Newark, counting 180 school days, for 45 medical assistants (doctors and nurses) and two cents for each *daily* report, the item amounts to about $162. This cost is included in this column. Meriden, the seventh city, happens to show the initial cost of printing, when the system was started. After a system has been well started and a reasonable supply of materials laid in, little needs to be paid for further printing. Where poorly considered forms have been printed in quantities, great amounts of obsolete forms and waste of money accumulate. Certain cities have so many different forms that the whole system is confusing, and doctors spend almost as much and even more time in making the daily reports, in their school time, as in inspecting or examining children. For a city of about thirty to fifty thousand population the cost of introducing a complete system of blank forms, nurses' equipment, etc., need not be much over $200.

c. *Medical Supplies*

The cost of medical supplies (Column 28) varies very greatly because of the great variance of opinion on treatments. Some hold that the schools have no business in this field while others contend that free treatment is not any worse and just as desirable as free books and free schoolhouses, especially since we have compulsory attendance and so compulsory danger of infection and unhealthful school environment. Some cities have such supplies in large quantities kept at the central school supply center and deliver them when needed, on requisitions from the principals. Others keep all the supplies in the separate schools; while some have the only supplies used in the nurse's bag (e.g., New Haven) which she carries from school to school. Again, some cities buy as the supplies are needed from the local druggists while others buy for a year at a time from wholesale medical supply houses, choosing the lowest bidder. Very little study by school business managers and others has been made of the most efficient buying in this field. Buying of local druggists seems to be quite expensive as items are overcharged. The investigator found in one city, for example, twenty-five cent hair brushes (for vermin cases) sold at $1.50 each. Most supplies keep well enough to be purchased for a year ahead, and this seems to be the best method, if the requisitions are made out with sufficient care and real public bidding by the best firms is solicited. A list of the principal supplies found necessary in the most progressive school systems will be given later. The cost of such supplies in the most liberal cities is comparatively very little. In these twenty-five cities the expenditure ranges from about zero to nearly three thousand dollars (Newark). The tendency will inevitably be in the direction of increasing the amount of free treatment. The writer's judgment on the matter will be found in the tentative standard plan offered for criticism in the last chapter.

3. TOTAL EXPENDITURES FOR PUBLIC SCHOOL MEDICAL INSPECTION

The *total* expenditures for Medical Inspection in the schools studied are given in column 29. In cases where the cost of supplies and other items could not be separated from general expenditures, the expenditures would be somewhat larger. Where the Board of Health has the school physicians and the Board of Education the nurses, numbers above are those for the latter, and those below for the former. The relationship of these expenditures to the total running expenses of the schools is given in column 53. The general correlation with total school expenditures can be seen from inspection to be very slight, as has before been pointed out in another connection.

D. Management of Medical Supervision Work.

I. TIME EMPLOYED BY DOCTORS AND NURSES

The school nurse, as suggested, works, on the average, five and a half days a week, giving seven to eight hours a day on school days and three to four on Saturday. Her total weekly hours are, therefore, very much in excess of the time put in by the average physician. In actual hours the average weekly time in hours of the physicians is to the average of the nurses in these twenty-five cities as 1 to 7 or 8. This ratio, by a coincidence, is that often given by those in charge of such work as to the relative worth to the schools of doctors and nurses. When a system has been properly organized, however, the physician will do only such highly skilled work as the nurse cannot do, and for the same amount of time the ratio will be smaller. Fortunately, the most common ailments of school children are so simple that they can be easily and efficiently handled by the well-trained nurse. There is no such responsibility for life and limb as the physician carries when he takes his cases in private life. For the nurse, there is nearly always the family physician or dispensary to check up her management of cases. The disadvantages of having physicians call at schools only once or twice a week, cultivating their private practice on other days at the regular school time, are so great and so numerous that it is being found best to have them go to the schools at the same time *every* school day. As will be shown later there is also a decided advantage in having the time spent by the physicians in the schools not less than *two hours*. And further, in this connection, in order to save the vast amount of time lost in traveling from school to school on any one day, it will be found more efficient to have the physician visit only *one school a day;* perform only the technical part of the annual examinations; and spend all of the two hours or more required in the *one* school, visiting, perhaps, five schools in the five days. The time for physicians each day should begin about ten minutes before school begins, so they may, in the schools where they examine, individually *inspect* such pupils, also, as have been out of school for several days or such as seem to the teachers or nurses to require immediate and skilled attention at the opening of school.

2. CHECKS ON THE WORK OF MEDICAL SUPERVISORS

School Physicians. No very efficient and entirely satisfactory checks on the work of physicians have yet been devised. Supervisors who have had experience in medical inspection work realize most the importance of devices for obtaining regularity and punctuality as well as accuracy of reporting and conscientiousness of pupil examination. The work is often looked upon as a "public plum" to be had for the picking—a little necessary money and very little work. The schemes devised for appearing to be at schools where they have done no work by physicians who have been turned off or reprimanded are startling in the extreme. One Board of Health officer said if he had his way he would turn off all his inspectors but one, but politics kept them in, though inefficient.

The checks at Newark are interesting and seemingly quite effective. Physicians are carefuly selected by the supervisor with the help of a written examination. Furthermore the supervisor (Dr. Geo. J. Holmes) frequently visits the schools and sees the inspectors at work. There are also monthly meetings of all doctors and nurses with the supervisor. But the checks, proper, come in the following:

1. A daily report of work done, in detail.

2. Occasional telephone calls to physicians or nurses at the schools, on business.

3. A schedule of visitation, so each doctor knows where he is expected to be at any time.

4. Principals' reports on the work of doctors.

5. Physician must sign a book in the principal's office on coming to the school and on leaving, and must give the time spent, in his daily report.

6. A monthly summarized report.

7. Conferences with teachers and nurses on their cooperation with the physicians.

8. Requirement of early notice on days when sickness keeps the physician (or nurse) at home so a substitute may be sent, the latter drawing the former's pay.

The necessity for careful checking up on physicians at work in the schools grows out of the psychological nature of the situation. There is a strong tradition that public office is a public sinecure; school work is monotonous and uninteresting to many; it furthermore interferes with the regular practice of the physician; and, finally, the pay is small; so the best and even the most public-spirited physicians are not, as a rule, drawn into the work. Where a system of medical inspection has, for example, been taken over by the Board of Education after having been in the hands of the Board of Health for a number of years, it has been found necessary, in order to get real efficiency in the work, gradually to dispense with the services of practically all physicians who had participated in the old, shiftless, time-serving system. A man once habituated in such a system will not usually change over into an efficient examiner or inspector under the new order. It is necessary as soon as possible to get new men and start them in right.

The checks for physicians found in these cities are given in column 37 and are seen to vary from zero and so-called "annual reports" down to an elaborate system of daily reporting. The efficiency of the systems will, in general, be seen to correlate closely with the shortness of the period reported. Especially where there is a very large number of physicians is this true. In a small system with a superintendent interested in the efficiency of the work, elaborate checks and daily reporting are not so necessary. Where in a small sytem a supervisor of (educational) hygiene is put over the work, mere checks are not so important as the need for accuracy of reporting; and this, of course, is all the way through an important reason for frequent reports carefully made out and balanced in some way. Close personal *supervision* decreases the need for checks.

There are good arguments for either a report sent in daily, or a weekly report which gives each day's work and in some way rounds out the week. The latter is especially desirable where there is not an adequate central clerical staff for summarizing reports, and where it is desired to have the doctor's and nurse's reports sent in as one summary, giving both the *number* of ailments and *what was done with them*. No city yet follows this plan. The *daily* reporting systems now in vogue have for the most part, it seems, been devised, and are being supervised and carried out, by men who have been school inspectors and know the nature of the problem. Monthly reporting, or any reporting for a longer time than a week seems to lead in most cases to inaccuracy and less careful work. I shall try to show this later where the factors which go to make up efficiency are set forth in figures.

One of the most exasperating sources of inefficiency in this field, as suggested, is a complicated system of reporting which tediously takes up much of a physician's time. Dr. Cornell shows the physician's side of the matter quite lucidly in his book, "Health and Medical Inspection of School Children," page 46:

"In our large cities, however, there is a tendency toward too much book-keeping by the school physician, and it is not unusual for *one-half or two-thirds of the medical examiner's time* to be consumed in the writing of multiple reports and complex records. Many of them are futilely devised to take the place of personal supervision, which, as has been noted, is essential in the conduct of medical inspection on a large scale. Their aim is not to record useful facts, but to check up the inspector's work and personal honesty. Failing to do this, because it is just as easy to record a false entry four times as it is to record it once, hundreds of dollars worth of stationery and thousands of dollars worth of salaries are wasted."

Any system that can be devised which will save the physician's time in making reports and at the same time insure careful work and accurate reporting is greatly to be desired. The standard plan offered in a later chapter dispenses with practically all reporting by the physician and gives it to the nurse. The nurse costs on the average for each hour of service about $ .50 (38 hours a week, 152 a month, at $75); while the physician costs, at least, twice this sum. It is poor scientific management which does not limit the physician to such technical work as the nurse cannot do well. The nurse can make out reports for herself and for the physician; and she can do much of the other work which the physician is now doing. The nurse, giving full time to the schools, can, moreover, be held more strictly to account and will feel more the whole scope and continuity of the work if she makes the combined report. In some school systems visited the nurse went her way and the physicians went their ways, each disregardful, quite largely, of what the others were doing. They should work as a team, each complementing the work of the other.

3. VISITS AND SCHEDULES

Many of the cities more experienced in the work have definite daily schedules for both physicians and nurses. For nurses, the schedule is practically universal. The number of schools assigned to each physician and nurse is given in columns 41 and 42, and the number of pupils in columns 39 and 40, and in later columns. Boston had a physician for each school, elementary and high, on the average, and one nurse for each two schools (now nearly as many nurses as large elementary schools). Waterbury has seventeen schools, many quite small, for the physician; while Providence has 40 schools for the one nurse. Since many or most of the cities, excepting Brockton, throw many obstacles in the way of the nurse doing much work of inspection, rules quite frequently prohibiting it except for very minor cases, it can be seen that daily inspection of pupils at all schools by physicians is out of the question in the short daily time in most cities. The time would be used up in mere school to school travel. Yet daily inspection at each school is the ideal of all these cities. The usual plea is for more physicians with which to meet this condition. Two alternatives seem not to have occurred to any city. *First,* combine all the phases of educational hygiene into one department; dispense with the services of the physical training supervisor, if any, and make director of the hygiene department for full time a man who is both a physician and a physical educator. This will give correlation and skilled supervision, making easily possible, *second,* the limitation of physicians to such medical work as cannot well be done by nurses, and the increase of the powers of the nurses so they may do much or most of the work of daily inspection. This is, however, the tendency. The Brockton nurse uses the physicians only for consultation purposes; New York City (Bureau of Municipal Research and Board of Health) has demonstrated that the nurses can inspect for infectious diseases and in some of the twenty-five cities nurses have found more cases of infectious disease then have the doctors (Norwood, Winchester, Montclair, Providence, and Boston, Cols. 206 and 207). If the nurse can make the daily inspections, which are almost entirely for the purpose of nipping epidemics of infectious diseases in the bud, the physicians need not spend time traveling from school to school, but can go to but one school a day, five a week, or ten in two weeks, if desired, thus reaching each school once a week, or once in two weeks, on a routine schedule and at the same time being on call from the nurse in case she is perplexed at any other school. The nurse could be on a schedule, and when her teachers were trained to detect the symptoms of infectious disease, she could avoid travel to all of her schools each day by judicious use of the telephone. (See the last chapter.)

4. EXAMINATIONS AND INSPECTIONS

Another great source of waste and confusion in this field is the almost universal failure to distinguish between making a careful, complete physical *examination*, similar to or better than an insurance examination, of a pupil, and a very *partial* examination, such as looking at only the hair of pupils of a room or passing up and down the aisles looking at only the hands and faces, for vermin or for infectious diseases. As a consequence, it has been almost impossible for the writer to determine for each city how many children have been given a complete physical examination. Some use the term "physical examination" and "examination" to distinguish but this merely leads to confusion. The writer has been driven to adopt for his own use the following definitions, which he recommends for standard usage.

Physical examination, or better, merely *examination* is to mean the complete, physical examination of a pupil to learn his general health condition, his physical defects and anything about his physical make-up which will militate against his school or physical progress. The examination will probably best be made once a year; and may be made by one or *more* persons, preferably, perhaps, by the nurse for vision and hearing tests and any other phases she can do well, by the medical examiner (heart and lungs, adenoids and tonsils, and certain other technical phases), and, third, by the teacher of physical training (height, weight, and chest expansion if these are thought desirable and required). To this in some schools (e.g., Cleveland) is now added the examiner for mental defects. Other systems have dental examiners and oculists. All of these persons together make the single, annual *examination.*

Inspection is a good word to use to mean any *partial* examination outside of the complete physical examination. Our first school medical work was "medical *inspection,*" because no physical examinations were given, we might say. Any looking at a pupil for any special signs, or any study of him by health officials apart from the complete annual physical examination is an *inspection.* Cities are trying to give each pupil *one* (physical) examination a year; they may give a pupil *fifty* inspections in a year if he requires it. A case of pediculosis may easily require fifty inspections before it is thoroughly cured. It may have been found first by doctor or nurse at the time of the examination.

If the nurse working alone examines fifty pupils today as to *sight and hearing,* how shall she record her work? It is only a *part* of the annual examination. This makes necessary a distinction between the *"medical"* and the *"scholastic"* examination; or, she may record so many examinations of vision and hearing and these can be combined with the report of the *medical* examinations by the doctor when they are made. This will prevent reports of two or three hundred or more "examinations" for from twenty-five to a hundred pupils. There can not be more physical *examinations* than there are pupils examined. Re-examinations can be called inspections or simply re-examinations.

Bringing together here the writer's classification of the many kinds of work being attempted in these cities in the field of inspection and examination we should have for any city with a fairly complete system:

A. EXAMINATIONS—complete physical, once a year.

1. *Medical,* only such phases as the nurse cannot do well, by doctors and dentists.
2. *Scholastic,* vision and hearing, and perhaps other phases by the nurses. This is now being done by teachers in three or more of the five states. Vision may be tested by oculists. Principals may make both tests.
3. *Anthropological,* height, weight, chest expansion and other similar measurements, by physical training teachers or nurses, if required. They are of no value as usually taken, and are practically never used or needed where well taken.
4. *Psychological,* for suspected cases of mental deficiency, or other abnormal mental conditions.
5. *Work Certificate,* probably not necessary in efficient systems.

B. INSPECTIONS—as many a year for any child as he needs to be seen, after or before the examination—also used for school building and home.

1. *September room-inspection*—quick inspection of all pupils at the beginning of the school year or term, room by room, doctor and nurse working as a team, one medically inspecting, the other recording. May be had oftener if desired. If so, they should be called general, or routine room-inspections.
2. *Occasional* room-inspection, any other room inspection after the general one in September; might also be called a *special* room-inspection.
3. *Individual* inspection—any inspection of a pupil

apart from group inspection—pupils in their homes, pupils returning after exclusion or other absence, pupils referred to either doctor or nurse, etc.

4. *Home-hygiene* inspection—by nurses. Recorded on pupils' individual health record cards.
5. *Sanitary* inspection of the school, or *"school sanitary* inspection." By any competent person delegated for this work. Recorded on a special school sanitation record card for each school, such as is used by the Philadelphia Board of Health. See Burks' "Health and the School," pages 187-8.

With this distinction between *inspection* and *examination* in mind it is possible to see where most cities stand in this matter and to determine whether they have merely "medical *inspection*" systems or something broader and more educational which the writer frequently calls "Medical *Supervision*," for want of a better term. *Health* Supervision has been suggested, but this is bad in that *all* phases of educational hygiene are really *Health* Supervision. Health *Inspection* is weak at both ends, as a term. Cities with no physical examinations are medical inspection systems; those having examination require a broader term. There seem to be only two disadvantages in the adoption of the term *Medical Supervision*, namely, that "Medical *Inspection*" is the term now used in most cities and state laws, and that directors of different phases of school work are usually called "supervisors," e.g., Supervisor of Drawing; and Supervisor of Medical Supervision does not make a very good term. He may, of course, be called director of hygiene if head of the whole department of school health, or "director" of medical supervision, if not. On the other hand, a good term can be helped to win its way; and only in the largest cities will there need to be directors of medical supervision, for in smaller cities the general health and physical development supervisor in whose department medical supervision is but one division, can be termed Director (or Supervisor) of Hygiene.

Since medical *inspection* is only part of the school medical work, it is very awkward and unfortunate to use it as part of the term covering all school medical work, as is now so often done. Considerable reflection on the already fixed character of medical "inspection" in state laws and common thought leads, however, to its reluctant use here. We shall hereafter use the term medical *inspection*. After this analysis and classification of school medical work, we can look at the tables to see at what stage our cities stand, from mere inspection for infectious diseases, very few of which ailments are found in schools, up to all-round, effective medical provisions, including annual examinations and frequent inspections for all pupils, and putting the emphasis upon cures and prevention instead of merely finding "cases."

5. NUMBER OF PUPILS FOR EACH DOCTOR AND NURSE

The number of children supervised by each doctor and nurse depends upon the kind of system, from mere inspection for infectious diseases up to the most intensive kind of educational health work and consequently fewer children, and upon the degree of development of the system. Many school systems start out with a few doctors and nurses in the hope of later obtaining an adequate number. The great danger here is that the first tentative steps may be taken as a permanent standard, just as emergency and monitorial teaching of fifty to eighty pupils in a school room has grown into established custom in many places. The number of children for each doctor and nurse is given for *elementary* children for the reason that most of the cities give very little or no attention to high school pupils in this particular.

The reasons given for the neglect of the high schools are as follows:—

a. Most medical work is found in the first four or five grades of the schools. Very little, comparatively, is found in the upper grades and high school.

b. High school students belong to a social class that does not respond well to the efforts of doctors and nurses. Furthermore, the pupils are older and better able to care for themselves and to obtain private medical service.

c. High school teachers are not so helpful as are the elementary teachers in referring ailing and defective pupils.

d. Departmental work in the high schools makes room-inspection of pupils more difficult.

e. The physical training directors of the high school in certain cases call the attention of pupils to ailments or defects urging attention by the individual pupil or by family physician, especially in the few fortunate places where such teachers are also physicians.

f. The age of the high school pupils makes them more sensitive and reticent. Cities (e.g., Newark) that have tried to give adequate and thorough medical examinations by baring pupils to the waist have had some trouble in carrying the work on. All, however, have not.

The best example of what *need* there is in high schools for medical supervision and what can be accomplished there, has perhaps best been shown by Prof. Thos. Storey, M.D., in charge of the gymnasium at the College of the City of New York and the high school connected with it. (See report of this work in the next chapter. Dr. Storey shows that medical work in the high school is of very great importance and that very much can be accomplished in the way of cures.)

The neglect of the high school and even the fifth to the eighth grades by many of the twenty-five cities studied (only three or four having done anything at all with the high school problem) makes it necessary to base computations as to the number of children for each doctor and nurse on the number of *elementary* pupils. These numbers are given in columns 39 and 40. For physicians, the average number of pupils each ranges from about 651 in Montclair to 12,077 in Waterbury. Since the physicians give irregular time, however, it is necessary to use the "equated physician" unit which takes into consideration the number of hours a week the physician works. The number of pupils for each equated physician is given in column 43 with the number of schools for each in column 42. The average number of elementary pupils for each physician on this basis is 3,407 and the median number 1,631.

The number of elementary pupils for each nurse ranges from 1088 up to 15,702.

Where the physician is unnecessarily called upon to make vision and hearing tests, to count the number of decayed teeth with the use of a tooth mirror requiring sterilization for each child, to make anthropological measurements of height, weight, chest expansion, etc., and, finally, to make out duplicate or triplicate cards of several varieties, forms and colors, it can be seen that fewer children can be handled in a year by each physician than in a more efficient system which eliminates much of this labor or gives it to the lower salaried and full-time nurse.

CHAPTER V

THE NATURE AND EFFICIENCY OF THE WORK DONE

After a study of the agents of medical inspection, their number, their cost, and their administration, comes naturally the problem of their *accomplishment*. The work of medical inspection in public schools easily divides into (1) the *finding of the children* who need medical attention, (2) *getting them cured* of their ailments and defects, and (3) *preventive measures* for making the former effort unnecessary. To make a simple, adequate classification, statement and test of the heterogeneous work now being done in these twenty-five cities, with their reports of all degrees of completeness and accuracy, is a task at present practically impossible. What is here presented is only a beginning and cannot lay claim to very great accuracy or finality. The hope is that certain general tendencies may be brought out and that future investigations of this subject may be made more easily. We are interested here not so much in the purely medical or purely scientific aspects of the problem as in the actual administration and its improvement.

In general, it may be said that the physicians, nurses and teachers *find* the ailing pupils, the nurses do most in getting *treatments* and *cures,* while there are no single *preventive* agents unless we might mention here the physical training teachers, the teachers in open-air schools, and a few others. As a brief introduction to the following tables setting forth the work done we shall give some of the generalizations which developed while traveling about from city to city studying this work:—

a. The focus of attention in most medical inspection systems is not on *prevention and cure* but on the *finding* (inspecting) of the cases. When asked for the purpose of the medical inspection work, in only one or two cases out of many have school physicians emphasized getting and recording treatments and cures. Even though all these cities have nurses, therefore, it is impossible from most reports or any other records to show the real efficiency of medical inspection in the amelioration of health conditions.

b. Most medical inspection is "inspection" and little more. Very few cities give complete physical examinations to even a part of the children each year. South Manchester is probably the only city that examined all school children in the school year studied, and exceedingly few examine high school pupils. The word *"examination,"* as related, is often used for *inspection*: an incomplete physical study of a child, usually for only a few symptoms like those of infectious diseases, pediculosis, or cleanliness. Further, teachers, nurses, and physical training teachers often make the parts of an examination, especially those relating to vision and hearing, and this has complicated matters. In some cases, too, voluntary agents have come in—dentists especially—and have made the oral and teeth examinations. Most physicians and nurses met distinctly favored one complete physical examination for each elementary and high school pupil in the school system annually, but did not unanimously think it feasible to attempt it where there was but a small inadequate force. Only certain deep-lying, incipient, or insidious ailments are missed when there is careful "inspection" *without* the annual examination. The *more serious* heart, lung, nervous or digestive system ailments, vision and hearing defects, adenoids, and the like, are frequently suspected, and the pupils referred to family physicians or dispensary without it. The importance of the many cases *missed,* however, is the reason for the thorough and complete examination. To repeat, we shall use here the term "examination" to refer to the single complete study, often made by more than one person, and the term "inspection" to refer to any medical study or looking at the child outside of this examination.

c. The difficulty of accurately recording the total number of children examined and inspected with the number of new cases found and the number of inspections ("old cases") that were necessary to get these cases treated and cured has, with the poor record forms in use, made it impossible in most cities to discover how many cases of any one ailment were found, treated, or cured or how many children were at any given time or at the end of the year affected with a certain ailment. When the physician gives a list of "cases" we cannot tell whether these are the *same* which the doctor has found or *new* ones or how many of these "cases seen" represent a single child. A child with pediculosis may be seen several times by the physician and twice or three times a week for several months by the school nurse or janitress; yet there has been but one case or child. A case of defective vision may be seen once by the nurse or doctor and never again recorded. Until clear distinctions are made between these matters in more efficient reports, medical inspection (or supervision) will be on a hearsay, theoretical basis and there will exist both the greatest enthusiasm, and ungrounded belief in its wonder-working influence upon school and community progress alongside of the greatest indifference and skepticism as to its utility.

To obtain adequate reporting and accurate data, the ailments, new and old, found by the physician *should be placed side by side with those found by the nurse* in such a way to show exactly how many new ailments were found altogether, how often they were re-inspected and what was the outcome. It would be well if a plan could be devised whereby one person, the nurse, could do all the reporting on a single form.* In the following tables the work of the doctor and nurses for each ailment is listed together, but the distinctions mentioned could not be made except for one or two cities.

These facts should make us cautious about making dogmatic statements about the number of children affected with various ailments in these cities or the country at large.

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*See author's plan in the last chapter.

d. Doctors, for the most part, record only the cases that are *printed* on the record cards or report sheets. They will not, usually, take time to write in the names of the cases *not* named in the report. This has been proved in a number of satisfactory ways. It throws light not only on the following tables but on the kind of record cards and reports which are necessary to get the best results. They must give all the different ailments and be very simple and convenient. The seventeen ailments making up 90 per cent of the cases found in all cities (Table IX) are not those appearing on record cards and reports. By the use of our classification of school ailments on the report forms, however, we can obviate the printing of a necessarily limited list of ailments on the individual record cards.

e. Although school inspection by doctors was started by boards of health to keep down epidemics of infectious diseases through the exclusion of germ-carrying children, on the theory that the school was the chief, if not practically the only place of spread, nevertheless, comparatively few cases of infectious disease are found in the schools, and the amount of spread at school is seriously questioned. Mothers rarely are wrong in their interpretation of the children's condition, and keep the children at home so the ailments cannot be found at school. The first notice the school gets in the usual system is the report of the board of health on quarantine. Children are, however, sometimes found who have returned to school too early. The surprise is in the small number of cases found in school in proportion to the number which actually existed. Table IX gives the actual number of ailments found, and the probable true number for the 54 classes of ailments.

f. There is a great lack of correlation and integration among the various phases of hygiene in the school systems which have adopted medical inspection. The proper kind of organic unity will probably not come in the health work for most cities until a full-time physician, physical-educator is made director of all school health provisions. Only then will there be real supervision, careful work, adequate reporting, and testing of results. If this dissertation does no more than to emphasize this need it will have served a worthy purpose. Such a director can now be obtained at a salary of about $3,000, but the added cost need not be so great because in most cases one or more physical training teachers and several part-time physicians can be dispensed with. The recommended plan, as well as the needed number of directors, physicians and nurses with salaries (Table XII) is given later.*

g. Very much dependence is placed upon the *teachers* in inspecting the children for ailments and referring them to the doctors and nurses. In many cases it may almost be said that the chief function of the physician has been to remind the teachers to look for the ailments, when the bell was rung, announcing his presence in the building. Where there is no annual routine inspection nor examination of all children the inspection has been more truly *teacher* inspection than *medical* inspection. So we shall find a teacher bias in the tables following. The need of inspection of the *teachers,* and of their *training* in this work in their professional courses and in their classrooms is very much neglected, to the great educational and economic loss to schools and teachers.

h. Teeth and such minor ailments are frequently given little notice by physicians, partly because their practice has omitted this element of health and partly because they find it of little value to record defective teeth when there is no school dental clinic or other adequate free agency for putting teeth in repair. Yet defective teeth are probably the chief source of many of the worst ailments of childhood and youth, not to mention later life. The words of the great Osler are familiar: "If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I should unhesitatingly say by defective teeth."

i. If the writer were asked which of the ailments in the

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*See also the article on this subject by the writer in the *New England Journal of Education* for Feb. 27, 1913, the address at the 1913 N. E. A. convention and the address at the 1913 meeting of the International School Hygiene Congress.

following tables had taken up most *time* of the doctors and nurses, which had actually absorbed most of the expenditure for medical inspection, he should unhesitatingly reply with the horrid word—*lice.* A child, especially a girl with her long hair, may be cured of this ailment a dozen times a term and still have it. One doctor on a comparatively very large salary spent most of his time during the year in going down the aisles of classrooms from the rear, using a small hand glass with which to spy out nits and other signs of vermin (pediculosis). His theory was that if children are taught to rid themselves of these larger parasites they will be better ready to accept the germ theory of disease and act upon it. The recent studies pointing to the larger parasites as the carriers of disease germs [the tick of spotted fever, the louse of typhus fever and perhaps other contagious diseases, not to mention the analogous work of the flea for bubonic plague or Black Death, the mosquito for malaria and yellow fever, the stable fly (Stomoxys) for the infection of infantile paralysis (Poliomyelitis), and the house fly for various summer ailments, especially ravaging infancy], all would strengthen this point of view.

While the theory is probably sound, the administrative question here is: "Would it not be far more economical and just as good service if the city were to use the money to employ two nurses on full time for such work instead of the one part-time physician at $1,200?"

Another interesting fact in this connection is that medical inspection was put into the school of one small town (South Manchester) in 1905 in the hope that the schools would soon be delivered of this parasitic plague (pediculosis); but even with the help of the nurse, the trouble has not been by any means eliminated, an irreducible minimum seeming to remain of those who furnish the parasites to others. The table shows a decrease in the number of children inspected as well as the number of times ailing, so the number has hardly decreased as rapidly as it appears.

	Total Number Pupils "Examined."	Cases of Pediculosis.	No. Pupils Excluded.
First year	421	216	150
Second year	458	282	135
Third year	477	227	125
Fourth year	342	96	108
Fifth year	318	84	89
Sixth year	117	66	55

"Examined" here means referred cases *inspected.* (Physical) examinations, one a year for each pupil, were begun in the year of this study. While there has been an increase in school population, there *has* been a decrease in cases reported and in the number of exclusions. It would be interesting to know whether the inspector has changed the meaning of "case" as time went on, and if standards of exclusion are not changing. The reports of this city should be followed up to see if the ailment is eliminated.

GENERAL EFFICIENCY OF THE MEDICAL INSPECTION SERVICE

Let us turn our attention first to the general accomplishment by the entire school medical service, and examine table VII which gives a bird's-eye view of this field. In order to separate unlike elements and to make clear what is actually being done, we have been driven to certain definitions which, we hope, may be of value not only for the purposes of this study, but also in actual school administration. The first distinction is between *Examination* and *Inspection,* already mentioned:—

a. *Examination* shall refer only to the complete physical examination of a pupil by one or many persons, and recorded on an individual, cumulative health record card for each pupil. The standard is one such examination a year, in this country, less often in Europe.

b. *Re-examination,* or re-examined, shall refer to the work done by any person who duplicates any part of the physical examination because of a need for more technical examination, because of doubt as to the reliability of the first findings, or for the purpose of checking up one or more of the first examiners.

c. *Inspection* shall refer, when relating to *pupils,* to any partial examination, looking at, or study of a child or children with a view to learning the condition of their health, outside of the two forms of examination given above. A pupil should be examined thoroughly once a year, perhaps, but he may be inspected fifty or more times.

d. Inspection, as a term, may be used also to refer to any study of school sanitation, home hygiene, or any other external feature.

a. Examinations. Nearly every city that attempts complete routine examinations of pupils has provided an individual, cumulative health record card for each pupil, and this definition will not exclude any city of the twenty-five that actually gives examinations. The work of examination is usually divided; and we find all agents from teachers to oculists making the *vision* examinations, and nurses, dentists and doctors making the *medical* examinations, and hearing tests. Some, also, have physical-training teachers make certain measurements of height, weight, chest expansion, and the like; and have in each school, or haul about, platform scales with attached height standards. These latter measurements are probably not worth the effort taken to get them. Doctors use other indexes in making diagnoses, and the examinations as usually made with shoes and clothing on are entirely valueless. The usual fate of such measurements, in the writer's experience, has been to fill physical training or medical inspection supervisor's offices with waste paper. As principal for several years, the writer made such measurements for an entire school, and found just one value in them: they could be used as a means of teaching the pupils the principles, ideals, and habit of correct carriage and deep breathing. The best development of these anthropological measurements seen by the writer will be found in the 1910 and 1911-12 reports of medical inspection in Dunfermline, Scotland. Even here they seem to have little pragmatic value and it is significant that chest expansion measurements, given with doubt as to their value in the 1910 report, are not mentioned in the last. Here, we can only raise the problem.

It seems the better and growing practice that nurses instead of doctors, teachers, principals, or physical-training teachers make the vision and hearing tests, where there is no school oculist for visual examination, or only for re-examination of actual cases as at Providence. The nurses can learn to make these examinations as easily as any of the other officials, and they have the several advantages of being the ones to get treatments, glasses, etc., of having a number of schools to examine in, thus giving more skilled practice and more uniformity, of being cheaper workers than physicians, of doing the work without turning aside and being "bothered," as is often the case with teachers, principals and physical-training teachers. States do well to have teachers do this work where there are no nurses; but cities and rural districts having nurses should, very probably, place the matter in their hands and give them training for doing it well. Oculists can be employed for re-examining the cases the nurses find and for prescribing glasses, treatment or operations for those who need them.

Aurists can be attached to school clinics for the hearing and discharging-ear cases.

b. Re-examinations. The nature of this process has, possibly, been clearly enough stated. It is very little used.

c. Inspections of pupils. These will be explained in detail in the tentative standard plan given later. Here it may be repeated that they are either routine or occasional inspections of all the children in *rooms* or schools for any general affections of a serious character, or for some special ailment such as pediculosis, infectious diseases, uncleanliness, and the like.

Individual inspections are made of pupils *referred* to nurses and doctors by teachers, principals or parents; of pupils *returning* from over two or three days' absence or longer, either voluntarily absent, excluded, quarantined, or for any other reason; and of pupils *entering* the school for the first time, after the first two weeks or more of school. The September room-inspection, or such inspection after each vacation or at the beginning of each term, will catch pupils entering in the first two or three weeks.

TABLE VII.

GENERAL SURVEY OF ACCOMPLISHMENT IN MEDICAL SUPERVISION.

		Number of Elementary Pupils Examined. With Use of Individual Health Record Cards. By doctors. 56	Percentage of El. pupils. 57	Average no. pupils per M.D. 58	By Nurses (N) and Teachers (T) Vision and Hearing Tests. Number. 59	Percentage of El. pupils. 60	Average no. pupils. to nurse. 61	Number of Elementary Pupils Inspected or Re-inspected. By Doctors. Number inspections. 62	Average per M.D. 63, 64	By Nurses. Number inspections. 65	Average per nurse. 66, 67
1.	Summit, N. J.	a1,034	96	1,034	N1,034	100	1,034	....	....	....	....
2.	S. Manchester, Conn.	1,725	d100	1,725	1,725	100	....	7,000	....	....	....
3.	Norwood, Mass.	....	...	....	....	...	....	108	108	6,048	6,048
4.	Winchester, Conn.	....	...	....	N243	...	....	....	....	6,670	*,670
5.	W. Orange, N. J.	....	...	....	"Some."	...	....	l3,093	3,093	....	....
6.	Montclair, N. J.	....	...	....	....	...	....	5,479	1,096	....	....
7.	Meriden, Conn.	b3,621	90	1,207	....	...	....	7,320	2,440	....	....
8.	Mt. Vernon, N. Y.	....	...	....	....	...	....	m6,700	1,675	946	946
9.	Newton, Mass.	....	...	....	T4,894	82	....	....	....	3,218	3,218
10.	Brockton, Mass.	....	...	....	T8,000	j90	....	1,309	q436	17,365	17,365
11.	Hoboken, N. J.	8,773	89	2,924	N1,457	14	1,457	....	....	....	....
12.	Schenectady, N. Y.	....	...	....	....	...	....	n6,889	3,293	27,823	13,911
13.	Waterbury, Conn.	....	...	....	....	...	....	o61,222	61,222	....	....
14.	Yonkers, N. Y.	....	...	....	....	...	....	14,874	7,437	8,425	8,725
15.	New Bedford, Mass.	....	...	....	T10,684	100	....	4,857	609	....	....
16.	Trenton, N. J.	10,587	83	1,323	gN6,491	52	3,245	8,378	1,047	3,470	2,477
17.	Cambridge, Mass.	....	...	....	T12,791	83	....	....	....	....	....
18.	Lowell, Mass.	....	...	....	T 9,524	92	....	10,329	1,147	....	....
19.	New Haven, Conn.	....	...	....	....	...	....	24,230	4,846	....	....
20.	Syracuse, N. Y.	240	1.3	20	....	...	....	605,917	r60,591	82,410	41,205
21.	Rochester, N. Y.	15,157	66	f1,263	....	...	....	32	....	....	....
22.	Providence, R. I.	....	...	....	i1,410	...	....	5,601	1,400	6,396	6,396
23.	Jersey City, N. J.	c33,568	95	2,797	....	...	....	32,834	2,736	28,052	4,675
24.	Newark, N. J.	24,310	42	e935	....	...	....	p208,209	8,008	s160,000	u, 20,000
25.	Boston, Mass.	....	...	....	T96,000	100	....	61,055	7,632	t60,863	1,800
	Average		84	1,626			1,912				

a. 350 others by nurse. *b.* From December to June. *c.* 1,411 in High School by director. *d.* Including High School pupils. *e.* Counting 26 M.D.'s. *f.* Highest number, 2,334; lowest, 180. *g.* 1,490 measurements taken. *i.* 2,273 vision and hearing tests by nurse in 1910-11. *i.* Oculist for vision, special cases, 685. *j.* Estimate, number examined not given. *p.* 9,965 classes inspected. *l.* 1,645 pupils. *m.* Includes 425 parochial pupils. *n.* Includes parochial schools. *o.* All grades up to 5th inspected once a month, by classes. 250 pupils an hour. Dental Ass'n inspected 3,736 pupils. *p.* 936 classes inspected also. *q.* Re-inspected for the nurse. *r.* Number counting the chief inspector *s.* 3,047 classes inspected. 101,286 cases seen. Estimated class and individual inspections. *t.* For lice only. *u.* 3,944 class inspection, also, and 6,000 inspections for uncleanliness.

TABLE VII.—*Continued.*

	Elementary Pupils Defective.			Treatments.			Cures.		Pupils Improved, Not Cured.				Daily Visits by Doctors to Schools.		Ailments found by M. D.'s, Nurses, Teachers, Dentists and Oculists.			
	Number.	Per cent of El. pupils.	Per cent minus teeth.	Number ailments treated, outside agencies.	No. of treatments, by nurses.	Per ct. of defective pupils treated.	Number.	Per ct. of defective children.	Number.	Per cent.	No. of home visits by all nurses.	No. pupils taken to dispensary or M.D.	Number.	Average per M.D.	Number.	Number referred as defective.	Per cent.	No. ailments minus teeth.
	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
1.	....	..	..	....	140	..	....	..	...	..	*l*229	....	*r*125	125	1,222	279	27	667
2.	....	..	..	....	....	..	....	..	...	..	....	....	72	72	1,250	....	....	612
3.	....	..	..	772	279	..	....	..	...	..	122	....	....	...	2,927	....	....	....
4.	3,000	60	..	1,280	*g*1,403	92	2,800	93	...	..	....	181	....	...	....	....	....	*2,016
5.	434	28	28	....	....	..	....	..	...	..	93	....	....	...	434	79	18	434
6.	....	..	..	....	744	..	....	..	...	..	320	114	*t*293	58	2,300	1,250	54	1,200
7.	2,500	60	25	333	....	*h*14	333	14	...	..	....	....	....	...	3,234	3,234	100	1,586
8.	x560	8	8	....	....	..	....	..	...	..	946	....	....	...	560	560	100	560
9.	3,975	66	29	....	....	..	....	..	...	..	414	....	....	...	3,975	....	....	1,768
10.	....	..	..	*d*125	....	..	....	..	...	..	*n*368	....	....	...	3,790	....	....	3,790
11.	2,050	22	22	*e*127	....	..	....	127	...	..	686	....	....	...	*y*3,500	3,000	86	3,500
12.	6,066	60	60	1,327	154	24	....	..	...	..	1,198	1,327	Few	...	6,066	6,066	100	6,066
13.	6,046	50	50	....	110	..	....	..	...	..	1,726	....	....	...	7,782	7,782	100	**6,046
14.	6,398	50	31	2,141	....	34	....	..	...	..	898	158	*u*71	35	6,398	....	....	3,924
15.	....	..	..	....	....	..	....	..	...	..	1,959	....	....	...	6,700	6,700	....	6,400
16.	v1,737	..	..	*c*	622	..	*i*109	6	*k*221	13	1,426	*q*800	713	89	*w*6,910	....	....	3,634
17.	....	..	..	623	....	..	....	..	...	..	1,709	623	....	...	1,592	1,592	100	1,592
18.	1,935	19	18	1,104	226	68	....	..	...	..	....	150	1,350	150	3,394	2,500	76	2,287
19.	2,092	9	9	....	4,424	..	....	..	...	..	*o*355	....	836	167	3,000	....	....	3,000
20.	2,553	14	14	....	652	..	....	..	...	..	*p*5,808	....	3,842	384	2,553	1,753	....	1,720
21.	14,004	60	31	1,859	707	12	....	..	...	..	2,126	813	2,039	170	20,760	....	....	13,976
22.	6,536	..	..	*f*1,701	....	..	....	..	...	..	2,315	....	....	...	7,000	....	....	6,440
23.	....	..	..	....	5,643	..	1,087	..	...	..	1,527	125	....	...	*z*	....	....	....
24.	y14,954	61.5	*a*40	18,351	43,116	..	15,934	..	*j*969	..	8,944	864	....	...	*v*25,585	....	....	18,461
25.	z14,176	..	..	20,000	33,925	..	Most	..	...	..	25,972	16,680	....	...	53,925	....	....	8,461

v. Recommended for treatment, of 4,585 cases reported by principals. x. Excluded pupils. y. On physical examination only. z. M.D.'s only. *a*. Teeth cases were 24 per cent of a total of 25,586 cases among 24,310 pupils. *c*. 210 by hospital. *d*. Adenoids and tonsils. *e*. Adenoids and vision cases only. *f*. Teachers' reports. *g*. 244 advised as to treatment. *h*. Not counting infectious ailments. *i*. Of the 1,737 cases reported, 1911 report. *j*. 1,448 *not* improved. *k*. Of 1,737 referred cases. *l*. 65 by doctors, extra. *n*. Also 533 school visits. *o*. 587 school visits. *p*. "Absentee calls." Also 795 school visits. *q*. 270 visits repeated. *r*. "Many" other special visits. Each school at least once a week. *t*. 586 *school* visits, average of 2 a day, 4 a week. *u*. Only 71 school visits, a less number of daily visits. *v*. Among 24,310 pupils examined. *w*. 6,910 cases found by inspection. *y*. Estimated. *z*. Excluded cases, only, recorded. *717 examinations with dentists. Number cases defective teeth not given. **No. including vision and hearing.

THE TABLE

Turning, then, to table VII we see that only eight of the twenty-five cities have complete *examinations;* and that all, of course, have more or less of inspection. A city may have only inspections by doctors and nurses, and have vision and hearing examinations by teachers. The latter are only partial examinations, and are not always recorded on individual cumulative health record cards as described. Some do not have the complete examinations, and must, therefore, be classed simply as medical *inspection* systems in the narrow sense, and yet have the vision and hearing tests (partial-examinations) by nurses, teachers, doctors, or others. The strong tendency is, however, in the direction of the complete examination along with the inspection.

Only one city seems to have examined all children in the school system, including the high school pupils, South Manchester, although a few had some inspection in the high school. The Boston Board of Education employed a special physician (salary, $1,008) for the high school examinations, but no record was obtained of his work. In Newark and Jersey City the *directors* of the departments of medical inspection examined a number of pupils in the high schools. The results are not included in this report of cases, or examinations. Summit began examining high school pupils in 1912-13.

The percentage of the enrolled elementary pupils medically examined varies from about 42 per cent in Newark to 100 per cent in South Manchester. The average for the eight cities (not including Syracuse, where we have only a record of work certificate examinations, by the Board of Health) is about 84 per cent. In Newark, the number would have been greater had more of the inspections and vision and hearing tests been made by nurses or teachers instead of by the doctors. (There were but eight nurses for the entire city with nearly sixty thousand elementary pupils.) The same may be said for Hoboken in part, for Rochester, Jersey City, and Meriden.

The average number of pupils examined by each physician, with and without the help of the nurses, varies from 935 in Newark to 2,924 in Hoboken, with Jersey City not far behind (2,797). The doctors in Hoboken, however, were paid $100 a month instead of $30 and $40 as in Jersey City and Newark. They were required to give three instead of two hours a day as a rule, also. Other conditions being about equal, according to time spent, they should have 50 per cent more examinations, and according to pay about three times as many. The number of *inspections* made in Newark, especially, is quite large, perhaps a reasonable number in Jersey City, while the number is not given in Hoboken, although the cases found by such inspections are given. Both Jersey City and Newark give also the number of *room* inspections, or "class inspections." None are given for Hoboken. Newark has given the doctors very much inspection to do, especially classroom inspection, and so gets fewer examinations.

In Summit, the nurse assisted the physician at all examinations and made 350 "examinations" herself. The latter may have been only inspections. Where the nurse assists the physician at the examinations there are many advantages and few disadvantages: She learns a great deal of the science and practice of medicine, with a good physician, especially as related to the care of her school children; she learns just what ails each pupil and what would probably be the best ways of handling the different cases; she assists the physician greatly by making the vision and hearing examinations, getting the children ready for the examinations by calling them from their rooms, calming their fears, keeping them in control, getting them washed if necessary, removing or loosening part of the clothing, etc.; she frequently helps to make all of the records, reports, notices, and the like; she gets the physician's advice immediately regarding any part of the examination she is making and over which she is puzzled; she frequently observes, from her own experience, certain defects or ailments which the physician may overlook; and last, but not least, she learns to know the *abnormal* child with respect to the *normal* child as a standard.

In Summit, one school has an exceptionally fine medical supervision room—large, well-lighted, even if in a partial basement, and fairly well equipped with tables, desks, hot and cold water, screens, a couch, medical cabinet, etc. It is probable that the nurse and physician working together as a team in the complete examinations of pupils can examine better 125 pupils in the same time it would take them separately to examine 100 pupils. No exact figures are obtainable on this problem. I know of no special disadvantages of such teamwork examinations. In Montclair, each school has a janitress, as well as a janitor, and these women are unusually helpful in all examinations and inspections, saving very much time for all concerned. They even give the treatments for pediculosis.

NUMBER OF EXAMINATIONS

Only 125 daily visits about an hour, on the average, in actual medical work with pupils (not counting travel to and fro) were made by the physician in Summit. How many of these were visits when only inspections were made we are not told; we judge from the report of many calls, probably 25, leaving 100 for examinations of 1,034 pupils. For, say, 170 daily visits of *two* hours each and with the assistance of the nurse, and with not a great many inspections to make, we should expect the physician to make (100 is to 2 times 170 that 1,034 is to ?) or 3,515 examinations, say, 3,000 annually. With a good deal of the inspection of referred cases to do, this 3,000 would probably be the maximum number annually. Here, however, the nurse was also attendance officer, throwing more inspection to the doctor.

Jersey City physicians, working, according to the rules, two hours a day and making the vision and hearing tests, and without the continuous help of the nurse (6 nurses to 12 doctors) and with the same average number of individual inspections, besides 936 class-room inspections, report almost the same average number, 2,797, doing better, probably, as to quantity than any other city. We cannot judge as to the quality of these examinations, of course.

In Trenton, the doctors, without much help from the nurses, except for vision testing, report an average of 1,323 examinations, and 1,047 inspections in 89 visits, on the average, of not much over an hour each in actual school medical work. The school year was 196 days. Counting only 170 daily visits again, we should expect at this rate from each physician giving the same time as now (89 is to 170 that 1,323 is to ?), or 2,250 examinations, and almost a proportionate number of inspections. For twice the *time,* which on the average would probably not exceed two hours, we should have 4,450 examinations. Then 3,000 would seem to be a *minimum* number, at least a very reasonable number, especially since we have deducted no days from the 89 for mere inspection visits.

At Rochester, for which we have the number of daily visits but do not have the average number of hours a day for each physician, our estimate, given in another table, is one hour. At any rate, an average of 170 visits is given, but how many mere inspection visits we do not know. The highest number of examinations reported is 2,334 and the lowest by a regular examiner (180 by a specialist) is 484. The median is about 1,550. Since we have the figures, this is a better figure perhaps than the average because of the wide variation. For twice the time we should again expect over 3,000 examinations as a median performance, and with nurses making the vision and hearing tests and helping at the examinations and making more inspections (only three nurses for the city), we should expect 4,000. So 3,000 here for two hours a day seem not to be unreasonable.

Meriden physicians made an average of 1,207 complete examinations without a nurse's assistance (only one nurse for the city) after the first of November when the system got started. For ten months the number could probably have been 1,500. They averaged probably an hour each day. For twice the time, and with no re-examination of defective vision cases reported by teachers (leaving this to nurses) and no measurements, we see that probably 3,000 pupils could easily have been examined during the school year, and twice as many inspections made by each doctor.

Perhaps experience will show that desirable improvement in the quality of examinations will force a reduction to a lower maximum than 3,000. Ohio has been discussing a state law for this maximum number for physicians and efforts have been made to make the number 2,000. Careful experiments have not yet been made which will make possible any dogmatism. Lack of funds requires a large number of pupils for each examiner, to start with. And if three thousand can be examined by one man it will be desirable.

VISION AND HEARING TESTING BY TEACHERS, NURSES AND OCULIST

These tests were all made by the *teachers* in Massachusetts and Connecticut, and to some extent in Providence. The records are unsatisfactory. In Massachusetts the examinations are made annually. The rules for Meriden, Conn., were as follows:

"Teachers shall make the vision tests and the proper records in connection therewith in September, or whenever they may enter, for all *new* children above first grade; in February for all children *in* first grade; and *once in three years* for all children. Tests may be omitted in the kindergartens."

Teachers reported all children with vision 20/40 or worse, and pupils with even better vision but with evidences of eyestrain, headaches, etc., to the doctors, and no others. The latter re-examined the pupils, and had the nurse send out messages. Had the re-examination been made by a school oculist and prescriptions given it would have been better.

The stop watch and whisper tests are chiefly used to test *hearing*. Groups of children are often tested at a time in this manner. The common test is whether the pupil can, with each ear and without seeing the lips, hear distinctly low spoken words or sentences at a reasonable distance. No attempt of which I know has been made to use the audiometer. Probably nearly all cases are found with little trouble in the present manner. Efforts should be made, however, to standardize and make objective the measurement.

The number of pupils tested for vision in proportion to elementary school enrollment varies from zero in Mt. Vernon and Syracuse up to a hundred per cent in four cities. Hoboken, perhaps, made more tests than are recorded by the nurse.

Where the nurses tested for vision or hearing or both, we are interested in the average number, for such tests take up considerable time. We know the facts for only one city, without qualification. Trenton's two nurses made on the average 3,245 vision tests each. Their other work seems to be little less than that of other nurses.

EXAMINATIONS

We have seen that the number of examinations may well be nearly 3,000 for two hours a day, five days a week, the nurse making vision and hearing tests and measurements, if possible, the nurse assisting at the examinations, and the work lasting through the school year.

This may be seen to be a probably reasonable number by beginning at the other end, the number of examinations in an *hour*. With no other work, and the nurse and doctor working as a team, and with simple records, at least ten pupils can be examined as a *reasonable* number, in an hour, twenty in a two hour period.

Without many individual inspections, this would be in 185 school days, 3,700 pupils for each doctor with a nurse. Counting off for all forms of inspection, but placing the burden of it upon the nurse, we see again coming out the estimate of a reasonable maximum number, perhaps, of 3,000 pupils.

In the long run, it seems best to give to nurses the vision and hearing testing. *How often* these should be made is doubtful, probably not as often as once a year for all pupils, as a matter of routine. In Europe, the complete examinations come only three or four times in a course of eight years. The Meriden intervals are recommended for consideration. Probably *every other year* would be wise.

In Newark and several cities, the children with 20/30 normal vision are recorded defective and referred. The more universal and desirable practice is to follow the English and Massachusetts plan given, referring only those 20/40 or less, unless they have other symptoms of eyestrain or other eye defects.

The Massachusetts' rules for *hearing,* quite generally followed, give 25 feet in a still room as the easily heard "standard whisper" (if there is such a thing), 35 to 45 feet for a low voice, and 45 to 60 feet for a loud voice. Most medical rooms in schools, or the places assigned to doctors and nurses in old buildings are very poorly adapted for such work. Halls are frequently used to give the desired space.

INSPECTIONS OF ELEMENTARY PUPILS

We can hardly discover the number of inspections of the different kinds. The doctor at Waterbury reports as many as 250 inspections an hour. This is by class-rooms and principally pediculosis and infectious disease inspection. Dr. Mercelis of Montclair estimates 50 children an hour as a reasonable number to inspect by rooms. *Individual* inspections are, of course, scattered over days and weeks, and probably take from one to five minutes each. As we glance down the columns, we see that Waterbury and Syracuse are counting room-inspections as individual inspections. Newark and Jersey City are the only cities giving the number of individual and the number of room-inspections separately. Several give only the individual inspections referred to them by nurse and teachers. Room-inspections should be recorded by *rooms* rather than by the number of individual pupils in them.

Boston included a parochial group of children, but the average is about 7,000 children inspected for each doctor.

How many room inspections are in this we could not learn. It is an average of over 40 a day for 170 days, probably more than any physician served.

Yonkers' physicians made no examinations and averaged for the two, 7,437 inspections each. How many different children this represents we do not know. Any pupil may have been inspected many times in a year. There were only 71 school-visits (one school, one visit), with sometimes two or three schools in a day. Unfortunately, the number of *daily* visits was not kept separate. But even counting it as 71 school visits, the average number inspected at each school visit was somewhat over a hundred.

Since we obtained from the reports, the facts regarding the number of times different schools were visited in Yonkers by the two physicians, and since the Superintendent has characterized each one for us, we give here these data:

Six schools visited only *once* during the year, mostly small country schools.

Four schools visited only *twice* during the year, partly small country schools.

Three schools visited only *three* times during the year, two in rich districts.

Two schools visited only *four* times during the year, one rich, the other rural.

One school visited only *five* times during the year, average, city.

One school visited only *seven* times during the year, large and poor.

One school visited only *eight* times during the year, large and poor.

One school visited only *nine* times during the year, large and poor.

One school visited only *eleven* times during the year, large and poor.

In sum, 20 schools visited only *seventy-one* times during the year, by the two physicians.

The average number of school-visits for the 20 schools is less than 4 for each school, and ten or half of them were visited less than three times, in 185 days of the school year. The city had only one nurse to assist the doctors. The enormous number of cases in proportion to the number of doctors and nurse (given in a later table) shows a need, probably greater than for any city visited, of an enlarged force. (Yet the writer was told that Yonkers was a wealthy city and needed little such work.) One school with 23 and another with 27 teachers besides the principals were visited but three times each, and another school with 25 teachers was visited but twice.

In Brockton, the small number of inspections by doctors is due to the fact that in this city the physicians are used only for *consultation* over puzzling cases, by the nurse. An average of 436 cases each is thus recorded. There was but one nurse for the entire city. One of the physicians is on the Board of Education, and donates his services. The work here shows what nurses may do alone if properly supervised. Oakland, California, has a large force of nurses with one full-time directing physician; and the system seems to work well. No one is on part-time. Pupils fail to get the same number of skilled routine examinations in such a system, but the puzzling cases may be re-inspected for the nurses; and probably nearly all real ailments may be found.

The median number of individual inspections, throwing out room-inspections which should be counted by rooms as in Newark and Jersey City (rather than by the number of pupils in them), is probably not far from 3,000. With the system devised as given for examinations, this number could probably easily be raised to 5,000, not counting room-inspections, of which there would be for each physician (3,000 pupils, divided by 40) 75 in the routine September room-inspections.

In Jersey City, the average number of *rooms* inspected for each physician was 78, and in Newark (counting an average of 26 physicians), 383, or an average of two or three a day. This large amount of room-inspections in Newark probably accounts for the small number of examinations. The average number of *individual* inspections is also large, over 8,000. Most of this inspection work could be placed in the hands of nurses at about half the salary per hour with probably better results, since the work is relatively simple when once learned, and since the nurse must follow up the cases anyway.

The *grades* in which most inspection, probably eighty per cent, is done are the first three or four. Most inspectors wisely emphasize this age period not only because there are many more cases, but because of the greater number of serious diseases and deaths at this age and the desirability of nipping pathological tendencies in the bud if possible.

INSPECTIONS BY NURSES

The number of inspections by nurses is given in the next columns (65 and 66). They range upward from practically zero, where nurses spend their entire time following up cases found by physicians. Several of the cities, especially those with board of health control of this work are in or very close to this class. We need not specify, because in most cities even nurses so restricted would probably find a number of cases without making any inspections (searches) for them in the schools. In the list of ailments given in a later table the fact that nurses in any city report more cases than are reported by the doctor and possibly referred to them would indicate, where she has not met the same case a large number of times, that they were probably finding new cases themselves. A great weakness in the reporting lies here. It is impossible to discover how many new ailments were found by both doctors and nurses, and how many were merely referred from the former to the latter. The term "case" should be avoided in all reports, "ailments" and "children" are better, since a "case" may mean several different ailments.

The nature of the report, or the lack of a report, on this item leaves a blank record of inspections for the nurses of twelve cities. The reporting for nurses is so relatively new that we should expect the emphasis to be placed in reports upon the work of the physician. Most nurses here probably deserve much better reports than they made or received. The large average figures in Brockton, Schenectady and Syracuse mean a large number of class-room inspections where the number of pupils rather than the number of rooms was recorded. But the record of Newark is extraordinary, for not only were there an average of 20,000 *individual* inspections for each of the eight nurses, but there were an average of 493 *class-room* inspections each, and an average of an extra 750 inspections for uncleanliness each. This, with an average of 1,118 home visits would seem to place the amount of work done by each Newark nurse far ahead of all others reporting. This is very probably due to an excellent administration of their work as well as to adequate reports and faithful performance of duty. However, it is difficult to make accurate comparisons.

For Trenton we give the number of inspections by a new, and by an experienced nurse, the latter making 2,477 inspections to the other's 993. The more experienced the nurse in this work the more of the service of inspections can be given her.

Were we to divide the average of 41,205 pupils inspected by each nurse in Schenectady by an average sized class, say 40, we should have a figure nearer the general tendency. Were we to allow for 5,000 *individual* inspections we should still have 900 *room* inspections each. At a half hour each, these would amount to 90 school days of 5 hours each. In Brockton, the 17,365 inspections (called "examinations" as they are in most cities) were as follows: throat inspections, 7,589; re-inspected (general), 605; inspected (general) next term, 7,971; re-inspections at office, 600. As before related, 1,309 were also re-inspected by the doctors.

The median number of individual inspections for each nurse, working 35 to 44 hours a week, is probably near 4,000. How many class-room inspections can be added to this depends upon the amount of home visiting and the character of the supervision. First-class supervision means in general first-class work. Lack of, or poor, supervision generally means work of uneven quality and a low general average.

The range of inspections is from 946 in Mt. Vernon, all probably actual ailments referred by doctors and teachers, up to the large numbers named.

What would be a good standard for a nurse with the plan mentioned would probably not be far from:

4,000 individual inspections	Newark nurse	20,000
200 class-room inspections	Newark nurse	493
1,000 home visits	Newark nurse	1,118
500 treatments, by the nurse	Newark nurse	5,623
300 taken to dispensary or physician	Newark nurse	108
3,000 examinations, assisting the physician	Newark nurse	?

The examinations with the physician would take probably one-fourth of the time. After school, before school and on Saturday mornings the home visits and part of the dispensary visits could be made. In the remaining three hours of each day, the inspections and treatments could be given. On the right, in the statement above, are given the average figures for each nurse in Newark. They are far ahead in all but dispensary visits and assisting at examinations. If possible, the standard of number of treatments by the Newark nurses should be equaled. Treatments by the nurse should, however, be separated from treatments by others outside of the schools. Nothing less than this and school clinics will effectually root out or keep down a very large number of bad filth and infectious ailments. Newark has gone far ahead of all cities in the treatment of these minor ailments of the poor, ignorant and needy, at least so far as records go. Without such treatment, the expensive system quite largely fails to function, even though, as in Newark, a great many treatments were made by outside agencies, such as hospital dispensaries, private physicians, dentists, oculists and parents.

PERCENTAGE OF ELEMENTARY SCHOOL POPULATION DEFECTIVE

It is again very difficult to learn the percentage of pupils defective, because cases and not children in many instances are reported. The approximate numbers so far as could be learned by much patient delving and inquiry are given in column 69. The percentages in the next column show the proportion of the elementary school population affected. The cases below 22 per cent are not representative and simply mean that the cases were not found, the inspections being limited almost entirely to infectious ailments in certain cities, as can be seen from the table of ailments found. The six cities below 50 per cent could all be explained in this manner. Hoboken alone, probably, has an unmerited low standing. The facts could not be learned from the reports. The eleven cities with no percentages would probably show a similar range as the fourteen given. The highest percentage given is 66 per cent and this is doubtful, because of the confusion as to cases, ailments, and children. Newark's report is definite on this; and 60 per cent seems to be near the truth.

But most ailments are *teeth* defects, percentages ranging up to 90 frequently being given for the number of children so affected. Many children are in good health with but this one exception. Leaving out such children with the great people's disease, we have a series of ratios (column 70) in the more representative cities hovering around 30 to 35 per cent. We should probably be quite safe in prophesying that one out of three of all the pupils in a school system are each year at some time seriously ailing or defective, not counting defective teeth and about twice this percentage if teeth are counted. *Roughly, a third have no serious ailments, a third have only teeth defects, and a third have teeth defects and some other ailments or defects.* We dare take neither the space nor the time here to compare in detail these results with those of other investigators. The New York percentages for 1911, with 230,243 pupils examined, are quite similar, only larger in defectiveness:

My General Estimate.		New York Results, 1911.
With no ailments	33 per cent.	27 per cent.
With only defective teeth	33 per cent.	39 per cent.
With D. T. and other ailments.	34 per cent.	34 per cent.

The likeness is striking, and shows the conditions of child health in the various cities to be probably much more nearly similar than are the doctors' reports. The general percentage for defectiveness in the whole elementary school population, taken together, and greater in the lower grades, is about 67 per cent; for New York City it is 74 per cent.

If this standard is fairly accurate, dividing the elementary school children roughly into three equal groups (good, fair, bad) we can use it as a measuring rod for determining both the health *problem* of medical supervision and how cities are meeting it.

We can say, for example, that systems which find less than forty per cent of the pupils with defective teeth, probably are not examining carefully for decayed teeth, reach only a part of the school population, or have had a wonderful crusade of dentistry.

A number of the cities named fall far below these standards. Eleven cities do not give the facts from which to judge.

Likewise we can say that cities finding enormous percentages of defective teeth, for example, probably have their standards for defectiveness too low, so, too many are counted; or that the city is just beginning the work (if this really makes much difference), or that here we have a factory town with much poverty, ignorance and immigrants.

Whether the standards stand the test of time or not, the value is in the beginning of such standardization of school health procedure. We hope the percentages of *defectiveness* may be greatly lowered. Later chapters derive tentative standards for each ailment, and group of ailments.

CURES AND IMPROVEMENTS OF AILMENTS

The function of medical inspection (or of medical supervision) is not only to find, but to promote the cure and prevention, of pupils' ailments. The emphasis should be strongly upon the side of cure and prevention. Prevention is so much a social and economic, as well as a school problem, that we may be pardoned for a while in concentrating upon *cures,* until our studies lead us back into those fundamental methods of prevention such as educational, economic, and eugenic reform. To get cures there must be treatments. We have recorded all the treatments by nurses alone, and by other agencies, in separate columns (cols. 71 and 72). They are not accurate, because the two forms of treatment are frequently confused or reported together, or the records are poor or misleading. That nurses should succeed so well in getting all these thousands of treatments in one of these early years of a great movement, is occasion for great praise and satisfaction. We are sure that many more in the blank spaces would make fair or good showings had we the facts.

But how many defective children, or what percentage of the ailments received treatment? The data hardly permit a guess. Newark records more than twice as many treatments as children ailing, and three-fifths as many cures as children ailing ("cases"). The number of cures is larger than the number of children defective; and this is quite normal for the average number of defects to a child is about two. We must find the number of new ailments rather than the number of *children defective* in this problem, and relate it to the number of ailments treated and cured.

The number of ailments found is given in another column (82). After it comes the number *referred,* showing that some cities record many minor ailments which they do not set out to get cured. It were better that they remain unrecorded, it seems. Until cities list for each ailment treatments and cures, this problem of percentage of cases treated will remain unsolved. Later we shall show that favus cases in Dunfermline were treated in the school clinic in one year on the average 94 times; so we have complicating features. Newark's data would give the facts except that the examinations covered less than half of the elementary school population and the inspections covered all. Judging only from the total number of ailments or children ailing found by the examinations we should say that 60 per cent were cured. But there were cases (ailments) found also by the doctors in inspecting children not examined, those who had been examined earlier in whom new ailments had arisen, and also new cases (ailments) by the nurses not found by the physicians and referred to them. When we have the sum of all these new cases (ailments) and then the sum of all cures, we can arrive at general conclusions as to efficiency. In some way we must know the total number of children afflicted and the number of ailments these children had and what was done with them.

What the form of reports should be in this field we shall attempt to work out in a final chapter.

The efficiency of the nurses is not adequately shown in these figures of treatments, cures and improvements. Experience in Philadelphia and elsewhere has shown over and over again that parents respond to only about five or six per cent of the notices of children's ailments without the assistance of the nurse. With an adequate force of nurses and good backing, they will probably raise this percentage up to fifty per cent or more. If doctors were more conservative about referring ailments this percentage would be raised still higher, quite legitimately and easily, perhaps up to eighty or more per cent. Better concentrate all energies on the worst cases, than to disgust parents and family physicians with notices of trivial ailments. "The doctor sent us home a notice that my little sister was too tall for her age," said one young lady to me. "What does he expect us to do to her?"

See the comparison of results of work of doctors and nurses for different ailments and for different social grades of population given in the pamphlet entitled "Medical Inspection of Public Schools, Philadelphia, 1913," printed by the Board of Education for the Fourth International Congress on School Hygiene. The charts show that parents seem to be responding better to doctors than formerly, but that the nurse is indispensable.

Further efficiency tables will be found in Chapter Nine.

CHAPTER SIX

THE AILMENTS OF PUBLIC SCHOOL CHILDREN

A. PHYSICAL DEFECTS

THE AILMENTS OF PUBLIC SCHOOL CHILDREN IN 25 CITIES

The Classification of School Ailments

The first and most difficult problem connected with a comparative study of the work done by doctors and nurses as reported in these twenty-five cities has been that of making a simple, working classification of the ailments of school children. Several hundred different names for the various ailments occurred in the various reports; many names for the same ailment were used; and no one classification or system of nomenclature seemed satisfactory. The word "ailment" here is used to cover all defects and diseases, and seems preferable to the term disorders used by Dr. Hoag, although the latter serves the purpose.

There are a number of classifications of human ailments but their bases are all pretty largely that of their death-dealing character and the parts of the body affected. There is, for example, the International Classification of Diseases and Injuries, the Bellevue Classification (Bellevue Hospital, New York City), the classification used by the U. S. Mortality Statistics, and the various classifications used by local and state boards of health. They are really classifications of the direct causes of death. One of the first distinctions here is the fact that the ailments most affecting school children and school work are quite largely *not* death-dealing. The proportion of ailments from which school children die is a very small share of the total found. As can be seen at the end of the table, columns 214 to 217 and 210 to 211, the deaths of children of school age in each city are very few in comparison with the number of cases of disease and these of ailments which occur comparatively infrequently. Moreover, the recorded school ailments are not all occurring in the age population, 5-19 inclusive. The classification of ailments here must be a *school* classification.

The problem then became a choice of names, or terms, and of division, or classification, in the logical sense. The classifications finally devised were one based upon the *location* of the various ailments such as is used by the Boston Board of Health, and a simpler classification, on a more pragmatic, educational basis. These two classifications were duplicated and sent out to a few nurses, medical examiners and supervisors of medical supervision with the result that the location-basis classification was rejected. There were too many divisions; and after such a classification is completed, there always appear ailments which must go into a *miscellaneous* group almost as large in some cases as the well-classified portion. We have a miscellaneous group in our tables largely because of ailments recorded only as "miscellaneous" in the reports.

The classification finally adopted and here offered for criticism is as follows:

I. Communicable Ailments.
   A. Parasitic and Minor.
   B. Infectious Diseases.
II. Non-Communicable Ailments.
   A. Physical Defects.
   B. Common Ailments.

The work of placing the many terms used for the various ailments under a few (54) rubrics was done with the help of the following texts:

a. Holt's "Diseases of Childhood and Infancy," Appletons.

b. McComb's "Diseases of Children for Nurses," W. B. Saunders Co.

c. Hoxie's "Practice of Medicine for Nurses," W. B. Saunders Co.

d. Ditman's "Home Hygiene and Prevention of Disease," Duffield & Co.

e. Cornell's "Health and Medical Inspection of School Children," F. A. Davis Co.

f. Hoag's "The Health Index of Children," Whitaker & Ray-Wiggin Co.

g. Medical Dictionaries.

Some of the practical considerations which have influenced this selection of terms have been the following:

a. The names of ailments actually used most commonly by school doctors and nurses.

b. The names which would be most easily understood by the parents and citizens to whom reports are supposed to be made.

c. Grouping the ailments according to the divisions of the *work*. Nurses have almost exclusive control over parasitic and minor infectious ailments, for example.

d. Emphasizing important and often neglected ailments and divisions of ailments by *position*. This accounts for placing the word "dental" before "teeth," for example. Important divisions and ailments are placed high in the list when possible.

e. The number of ailments which would be an optimum number upon which to report, taking into consideration the many practical exigencies.

For certain of these reasons the division of non-communicable ailments is placed first. These ailments are probably most important for school life, especially physical defects. Diseases which occur very infrequently or have little effect upon school life are omitted, blank places being left after each group on our report for writing in these, if found. (See final chapter.) We recommend that an N. E. A. committee be appointed to further condense and standardize the classification.

The reader should examine the complete classification given in the last chapter.

All classifications are compromises and are to be judged by the service they render. The many faults in this classification are probably obvious, but it serves our present purpose of displaying in convenient form the ailments found, and may be of value in bringing about a more serviceable one for the use of schools. At present there is practically no genuine and satisfactory classification in use by any schools.

ANALYSIS OF TABLE VIII

One of the first tables made by the author was an attempt to show the number of cases found by doctors and by nurses and the number of ailments treated, improved and cured. Such a table, while offering the possibility for needed data, was very cumbrous and was conspicuous for its vacant spaces, the data not being given by enough cities to count for much. In the table as here offered, there are three columns each for only six physical defects; the ailments found by the physicians, by the nurses, and the number treated, cured, or found treated or cured. For the most part the ailments found by the physicians are referred to the nurses, especially where parents do not respond within a given time (and, to repeat, only about five or six per cent of parents do respond to physicians' notices without the nurses' visits) so the *sum* of the doctors' and nurses' cases would not be the true total of ailments. Every ailment, too, is not a *new* ailment. In certain cities, and for certain inspectors and nurses within cities, every time a child is seen for a given ailment we get a record for another "case," ailment. This helps to account for some of the large sums and, presumably, very bad morbidity found in certain cities. Where we find a record of very many more cases of an ailment found by nurses (See adenoids in Cambridge, New Bedford, Brockton, Winchester) than by physicians we may be sure that here the sum given by the nurse represents nearly all the ailments. These difficulties with double reporting seem also to point to the nurse as the one to make the only and complete reports of medical supervision. The record shows in general the total number of cases found by doctors, referred to the nurses, and "seen," treated, procured treatment for, or found treated, by later inspections by teachers

TABLE VIII.

DISORDERS FOUND BY DOCTORS, NURSES AND OTHERS. TREATMENTS AND CURES.
I. NON-COMMUNICABLE AILMENTS: A. PHYSICAL DEFECTS.

	Adenoids, Nasal Obstruction, Deviated Septum.			Anemia.		Deafness, Def. Hearing.			Dental, Teeth.			Enlarged Tonsils.			Eyesight, Vision.		
	Found by Doctors.	Found or seen by Nurses.	Found treated or Cured.	M.D.	Nurse.	M.D.	Nurse.	Treated.	M.D.	Nurse.	Treated.	M.D.	Nurse.	Operations.	M.D.	Nurse.	Glasses
	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102
1. Summit, N. J.	....	34	....	9	....	9	..	..	552	....	....	116	....	....	194	...	....
2. Manchester, Conn.	33	....	27	....	....	....	..	..	538	....	....	276	....	*e*27	111	...	98
3. Norwood, Mass.	....	19	....	....	4	....	15	..	....	984	112	....	45	....	...	60	5
4. Winchester, Conn.	....	80	62	7	8	1	26	18	2	....	84	36	138	62	...	220	70
5. W. Orange, N. J.	195	....	....	....	....	5	..	..	....	....	....	....	....	62	25	...	....
6. Montclair, N. J.	37	65	....	5	....	7	16	16	35	....	7	60	....	37	51	47	47
7. Meriden, Conn.	....	....	....	....	....	....	17	17	1,684	....	167	....	....	49	...	...	75
8. Mt. Vernon, N. Y.	....	....	....	....	....	....	..	..	....	....	....	....	....	....	...	...	....
9. Newton, Mass.	555	461	....	....	....	....	*346	..	....	2,207	....	....	....	....	...	*414	....
10. Brockton, Mass.	....	1,633	125	....	....	....	*149	..	....	....	....	....	*e*1,633	125	...	*750	....
11. Hoboken, N. J.	1,855	39	45	117	2	68	3	3	3	11	....	11	....	45	247	...	82
12. Schenectady, N. Y.	467	496	....	8	3	....	..	..	....	....	....	49	....	....	562	...	21
13. Waterbury, Conn.	843	13	13	25	....	13	..	..	*d*...	....	....	139	....	....	104	...	....
14. Yonkers, N. Y.	657	488	105	9	3	98	74	25	3,063	2,474	662	1,235	1,023	195	284	676	212
15. N. Bedford, Mass.	....	995	31	2	....	....	*a*414	..	....	300	....	16	713	31	5	*f*632	....
16. Trenton, N. J.	563	....	70	121	2	60	..	3	3,276	....	13	1,723	....	50	...	619	67
17. Cambridge, Mass.	122	366	17	16	33	6	*b*45	..	1,905	8	....	99	366	....	27	*g*194	14
18. Lowell, Mass.	329	....	88	....	....	....	*c*277	..	107	....	22	721	175	175	...	*h*51	64
19. N. Haven, Conn.	....	....	....	....	....	....	..	..	....	....	....	....	....	....	...	...	....
20. Syracuse, N. Y.	5	....	....	....	....	3	..	..	34	....	....	25	....	....	22	...	....
21. Rochester, N. Y.	1,756	1,050	....	1,288	....	628	135	..	6,784	....	....	4,452	....	....	1,285	348	....
22. Providence, R. I.	248	....	....	45	....	76	13	..	563	300	60	272	260	207	1,410	250	250
23. Jersey City, N. J.	....	....	....	....	....	....	..	..	....	....	....	....	....	....	...	...	....
24. Newark, N. J.	1,866	1,130	238	....	....	396	..	..	7,124	....	712	4,588	....	416	3,003	...	989
25. Boston, Mass.	3,087	2,472	1,172	852	1,980	337	..	..	2,444	9,204	....	4,101	2,182	913	617	1,581	1,742
	12,652	9,311	1,993	2,504	2,035	1,707	448	82	28,114	15,488	1,839	17,910	6,535	2,394	1,197	5,428	3,736

*Found by teachers. *a*. Teachers found 288 cases. *b*. Teachers found 320 cases. *c*. Teachers tested 9524 elementary pupils and found 277 cases; tested 1,255 High School pupils and found 55 cases. *d*. Inspection by Dental Association. *e*. And adenoids. *f*. Teachers found 1,555 cases. *g*. Teachers found 2,549 cases, 264 of which were found in High School.

TABLE VIII.—*Continued.*

	Eyes Crossed, Strabismus, Squint.			Glands Enlarged.		Heart.		Lungs Weak. Not Tuberculosis.		Malnutrition, Debility. "General Condition."		Mentality.		Nervousness Chorea Habit Spasms.		Palate.		Skeleton Orthopedic.	
	M.D.	Nurse.	Glasses or operation.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.
	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121
1.	2	...	...	103	...	3	...	4	...	12	...	12	...	8	...	...	...	1	...
2.	1	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3.	..	2	...	...	8	...	1	...	...	...	9	...	85	...	2	...	1	...	1
4.	1	...	...	6	18	2	...	...	...	...	1	...	...	...	4	...	...	5	...
5.	..	...	...	...	...	18	2	...	...	1	...	...	...	...	...	...	...	...	...
6.	..	...	...	...	...	...	...	...	...	124	32	5	5	17	14	...	1	3	12
7.	..	...	...	20	10	...	...	...	T44	...	...	...	1	...	...	...	...	...	...
8.	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9.	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	18
10.	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11.	..	...	...	4	1	128	3	15	...	2	2	...	...	3	1	...	...	66	...
12.	..	...	...	29	...	...	...	...	...	1	2	43	47	17	...	...	...	5	2
13.	89	...	...	114	...	11	...	3	...	27	13	14	...	6	...	...	...	1	...
14.	47	...	12	...	3	2	1	...	...	4	...	...	3	...	1	2	...	1	3
15.	4	221	...	15	...	1	...	18	...	2	55	7	...	...	...	...	...	...	6
16.	25	1	...	7	8	119	...	8	2	45	...	12	...	8	8	...	...	25	...
17.	15	95	...	27	18	1	...	...	...	22	...	24	...	14	4	7	1	...	11
18.	..	...	...	...	...	...	...	...	...	24	...	...	...	5	...	...	...	...	2
19.	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20.	..	...	...	39	...	3	...	...	...	...	...	...	...	...	...	...	...	1	...
21.	..	...	...	1,281	...	77	...	7	...	752	...	...	...	...	...	39	277	154	...
22.	100	...	...	61	16	9	5	...	...	54	100	79	...	134	6	1	...	21	...
23.	..	...	...	...	...	...	...	...	60	...	...	...	...	...	4	...	...	...	...
24.	..	...	...	4,147	...	354	...	170	...	650	...	339	...	77	...	392	...	287	...
25.	173	164	...	683	517	114	129	...	166	726	278	...	...	122	28	...	...	95	109
	457	483	12	6,537	599	842	141	225	272	2,446	492	537	141	411	72	441	280	673	174

See next table, pages 184 and 185, for spinal and speech defects and for the general summary of the seventeen defects.

or nurses. The nurse's column shows, then, for the most part the cases which the nurses themselves treated or tried to get treated and cured through the homes or other agencies. There are many excuses, of course, for the poor showing which many cities make on this chart, through the absence of better reporting. For a board of health with long experience in the health field, and with a system of medical inspection organized for several years, there is, however, hardly any good excuse. For five of the cities, the writer made the summaries of the doctors' and nurses' reports for the year studied. (Norwood, Montclair, Waterbury, Yonkers and New Bedford.) For several others, partial summaries were made, as for the nurses of Trenton. This partly accounts for the greater detail of the records for these cities. Most of these cities have since printed summaries of this work and it has been interesting and instructive to get from these what such a report may mean, and how much it may vary from the real work, and the monthly and weekly records. The protracted and tedious labor of making such summaries for a year, especially where there were weekly reports from a number of doctors and nurses, gave some valuable insight into what good *reporting* should be.

Some cities, like Jersey City and some of the board of health cities, reported only, or practically only, the *excluded* cases, children so afflicted that they were sent out of school. Such cases are, of course, but a small percentage of the actual number, and such reports are of little value educationally. The efficiency of medical inspection cannot be measured or recorded by such meager data. As they stand, the records require interpretation city by city and almost item by item, so many deductions of scientific exactitude cannot be drawn from them. It will be necessary later to take good records of several cities and make a special study of them.

Another thing which must always be kept in mind in looking over such reports is that many of the ailments listed are only "*suspected*" ailments. This is especially true of infectious diseases, adenoids and any other ailments which are difficult of diagnosis. The children are referred to family physicians, clinics and dispensaries for more careful diagnosis and treatment. This lack of final responsibility for an ailment sometimes makes school medical workers careless. The writer has seen many children recorded as having ailments, adenoids or enlarged tonsils, for example, where, from his own study of medicine, and experience in schools, hospitals and dispensaries, there were no such ailments—the enlargement being quite normal, at least not pathological enough to require attention or treatment. Such cases are so frequently reported "negative" by family physicians as to disgust the parents and make the best results hard to obtain. Exclusions, too, are in most cities far more frequent than necessary. Every city should have such supervision of this work as will adequately review the inspections, examinations, exclusions, etc., and hold physicians and nurses as strictly responsible as the nature of the work will permit. Nurses seem more careful than doctors, since they must follow-up the cases.

A. PHYSICAL DEFECTS

1. *Adenoids.* Some cities report only "Obstructed Breathing" for this defect, because physicians find it desirable to report the symptoms without making a manual exploration which frequently hurts and frightens the children. The medical phases of this work are so well treated by Cornell in his text on "Medical Inspection," referred to before, and in other texts, that only some of the *administrative* problems will be discussed, for the fifty-four ailments, in this place. Of the 12,652 adenoid cases reported by physicians and the 9,311 found or seen to by nurses, certainly many more than the 1,993 given were treated or found cured on re-inspection. However, some cities make the mistake of taking the *teachers'* reports as to cures. No ailment should be counted "improved" or "cured" which is not found so by competent *re-inspection,* or checking-up-inspection, by the doctor or nurse. Such obvious cases as the wearing of glasses after vision has been reported de-

fective, even, should be handled in the same way. The glasses may not fit. This, in general, is an administrative fact purchased very dearly in experience in a number of progressive cities.

There were also more cases of adenoids and nasal obstruction found than are here reported. Several cities have no records of this important school ailment. Meriden probably found many cases but for some unknown reason they were not given in the report.

Our interpretation of the Summit report is that there were 38 cases in all found, but no report was made of those operated on, or treated. The same is true for Norwood: 19 cases found, no record of cures, although the nurse did take a number of children to the free clinics of Boston for operations. For Winchester, no cases are reported by the physician and 80 are reported as found and 62 as cured by operations, by the nurse. The report here is in this form: "Operated upon for tonsils and adenoids....62." We cannot be sure that all were operated on for both adenoids and tonsils though this method is quite general, since the two ailments are very closely associated. For reporting, however, the two should be separated, since it is only a matter of convenience that both operations take place at once. The report would be better in this form using the terminology of the report, "Mouth breathers," 80; operations, 62 (?); negative, —; not treated, —. Enlarged tonsils, 138; operations, 62 (?); negative, —; not treated, —.

Although we have only about six or seven scientific studies of the relation of school defects to school progress,* and consequently cannot assert any more than that adenoids and nasal obstructions have very serious effects upon health and school progress, it seems clear that those cities which have failed to keep record of the number of cases found, and what was done in the way of getting them cured, stand

*See the new, rewritten edition of "Medical Inspection of Schools" by Gulick and Ayres of the Russell Sage Foundation, Chapter IX; also Wallin's study of Oral Orthogenics in the Cleveland schools in *Dental Cosmos* for April and May, 1912.

in efficiency far below cities which make such efforts. Practically the only cities emphasizing the reporting of cure and treatment are Newark and the nursing division of Boston.

Some of the chief weaknesses in the reporting of this defect seem to be as follows:

a. Many cases are undoubtedly not "cases" at all, but fillers for statistical columns, "to frighten citizens into providing a sufficient corps of doctors and nurses." The physician at Summit makes a good distinction between cases that are slight and those that are really serious and demand immediate attention, as shown for three defects as follows:

	No. Cases Found.	No. Cases Referred to M.D.	Percentage Referred.
Adenoids	34	34	100
Enlarged Tonsils......	116	39	25
Defective Teeth.......	552	155	28
Defective Vision......	194	85	43

Here it is evident that only such cases of adenoids as were really *serious* were *recorded* and all were reported. Why minor cases were not recorded as is the case of the other three defects named is not told.

If such distinctions are made in all cases, the placing of minor, unreferrable cases on the individual record cards may prove of some slight value; but as a general principle of reporting in this field, experience in a number of cities seems to show that *only such cases as need treatment and cure, that are really serious and demand attention by parents and family physicians, should be recorded and reported.* This would reduce the Summit cases to those of the second column, and this proportion of reduction would probably apply to each city.

b. Many of these cases are "re-inspections," instead of new cases. At the time of some inspection of the child, or at the time of the physical examination in the few cities that have examinations, a pupil is found, for example, with adenoids. This is one new case. But the pupil does not obtain treatment, say, and is referred to the school doctor again, one or more times. These re-inspections, or better, "old-cases," are frequently counted as if they were each a different child with this defect, otherwise, on the poor report forms supplied, the physician would get no credit for his work.

Good reporting must show the number of children with the defect as "new cases"; and all inspections to see if a child has procured treatment, is keeping up treatment, or is progressing well after an operation or other form of treatment must be recorded and reported as *"old cases" inspected.* See forms in last chapter.

c. *Negative* cases are not deducted from the total number of suspected cases. For example, a child is diagnosed as having adenoids. No careful manual examination is made or the adenoids are not very large or perhaps only temporarily congested. The physician cannot say for sure that this is a case for medical or operative treatment, but reports it for the family physician to pass upon. The family physician examines the child and calls it negative, or no case. Unless a very skilled specialist in nose and throat ailments is the school physician, as is very seldom the case, later reports should *deduct* this case from the total. I know of no city that does this, although the Montclair reports make it a possibility.

d. The nurses do not show how many cases have been *referred to them* by the school doctors and how many they have themselves found. Thus in Boston, for example, where the physicians are under the Board of Health and the nurses are not, we do not know how many of the 2,472 cases reported by nurses have already been found by the physicians and referred to them, so we cannot tell how many cases were found in the city, or how many pupils suffered from adenoids. We suspect that the number is far less than the sum of the doctors' and the nurses' cases.

In the case of Brockton, we know how many cases were found by the nurse, since the doctors are used only for consultation and consequently have no cases to report, all being found by the nurse. The nurse, however, fails to state the number of *children* who had adenoids, although we suspect from the report that it is almost as large as the number of "cases."

Reports must distinguish cases merely handed on by the physician from those found by the nurse, and must distinguish between *pupils* and *cases,* or re-inspections.

e. *Treatments* are frequently not recorded; many recorded on the teachers' or pupils' statement without an inspection by nurse or physician are really not treatments at all. A pupil reports treatment when he hasn't had one, to avoid trouble. Furthermore, a distinction should be made in the *kinds* of treatment obtained, operative or medical. A spray or gargle which has no beneficial effect is often used and is called a "cure" when adenoids are still there after its use as bad as ever.

Reports should show that a real cure or improvement has or has not been effected. Only an inspection will establish this.

f. Another troublesome matter, influencing reports, is the fact that adenoids "come back." The famous English Board of Education (London) reports by Sir Geo. Newman, M. D., consider this. The 1911 report shows (page 50) that many children may be operated on three or more times and the bad symptoms still remain. Even after an operation which may well be called a treatment a child should not be called cured unless the bad symptoms: mouth-breathing, snoring respiration, nasal deformities, etc., cease. In the case of adenoids, this result frequently cannot be obtained without widening the child's nasal passages at the time and after the operation, and without breathing exercises directed by the regular or physical training teacher. The latter has been tried and found valuable in Montclair, N. J., by the physical training teachers.

After all these strictures what have we? How many pupils in these cities suffered from actual, severe cases of adenoids or other nasal obstruction which needed real treatment, medical or operative; how many got such treatment; and how many were cured of their ailment or were only improved? No one in the world can answer with accuracy, and hardly approximately. We must remember, too, that many severe cases missed attention in a number of cities because the children were not *examined* and because not all were even *inspected* for this defect.

The daily work of doctors and nurses cannot now be reviewed; and the number of mere estimates necessary to a complete summary for the twenty-five cities is probably so great that the results will not carry conviction. The inspection in most cities has necessarily covered only part of the elementary school population, so the figures would be much reduced by the various considerations given above, and would be raised if we were making the estimates for the number of ailments in the entire elementary school population. Tentative, empirical estimates seem to indicate that the number of cases set down as the sum totals for doctors and nurses is not far from the number of new cases, or pupils affected, to be found by both officials in the total elementary school population of 413,393 pupils, counting all as new cases found by the doctors and all as new cases found by the nurses and not referred to them by the doctors. This would make the number of children having serious cases of adenoids and nasal obstructions about *five* per cent of the number of elementary school pupils. The figures are only *two* per cent for Summit, the same in Winchester, and 12 per cent in West Orange; but of the last 195 only 65 were considered serious enough to refer to the parents and family physicians for possible treatment, making only about *four* per cent.

Wherever we get the actual number of these cases that are really serious enough to be referred for treatment the percentage does not rise above that for the total of nurses' and doctors' cases for the twenty-five cities, *five* per cent. This is about half the number, or percentage, usually given as the number of cases. About ten per cent of all children examined are usually reported as having adenoids or other nasal obstruction.* In Milwaukee for the same year,

*See 1913 edition of "Medical Inspection of Schools," by Gulick and Ayres, page 40.

1910-1911, 19,616 pupils were examined, of whom only 2,493 were recommended for treatment; the total number of physical defects found were 18,299, of which 11,380 (over half) were defective teeth, and 1,049 adenoids and nasal obstruction. If no cases were counted *both* adenoids and "defective nasal breathing," and if all pupils with these ailments were referred for treatment, which seems very unlikely from the above figures, the percentage of cases of this defect is only about *five.* It is interesting to note here also that there were on the average 6.2 defects for each child.

2. ANEMIA

For summary purposes this ailment may as well have been placed with malnutrition and debility, perhaps. It is given separate record because of the large number of separate records given it in the reports. The sum of cases found by doctors and nurses is 4,539, or less than one per cent of the total number of elementary children in the cities. Boston has a combined number of 2,832 or over two per cent of the school population but here quite evidently all the doctors' cases were passed on to the nurses who counted them again, and found 1,128 new cases themselves, unless some of the latter were duplications, from meeting an anemic child more than once. The number counted cured of this ailment was so small that the figures given were not put down.

In the cities where there were open-air schools (S. Manchester, Montclair, Schenectady, Cambridge, Providence, and Newark) it is important and surprising to notice that this ailment is one most frequently given as the cause of admittance, not tuberculosis. The children are anemic and run down, probably suffering from malnutrition, and need rest, food, and recuperation. The number of tubercular children of whom we hear so much are conspicuous by their absence from these reports (columns 167 to 172 of the table) only 81 cases being found by doctors that are not marked merely suspects, and only 223 suspected and actual cases together. The number of cases is not great enough to cause alarm; the important thing is to find those pupils who will most surely become consumptives in early adult life, and give them special health education, diet, outdoor life, and treatment.

Probably one per cent of the pupils are anemic.

3. DEAFNESS, HEARING DEFECTS

For this ailment, too, the returns are very variable. In Massachusetts and Connecticut the hearing and vision of pupils are tested by the teachers. There are no very definite standards of examination followed in this work; and the great number of teachers and other persons engaged in it, all with little or no supervision, makes for little accuracy in results. Where the tests are made by teachers, we frequently found that the teachers had got around the law of 1906 by detailing one of their number in each building, or a teacher on each floor, to make all the tests. A substitute is called into the teacher's room who does this work for herself and the other teachers, and thus a certain amount of school interruption is dispensed with, and a degree of uniformity is reached. In several cities many of the principals make the tests. This feature and the fact that in other places the nurses make these tests for the entire school system without any need of a substitute and with a great deal better opportunity for skilled work and uniform standards, have furnished the suggestion for the tentative standard plan found in the last chapter that only nurses should do this work in all cities. The reports of specialists in these fields to the legislature of Massachusetts before the law was passed, to the effect that teachers could make such tests even better than regular medical practitioners, would be even stronger when said of the nurses.* It would be distinctly uneconomical to employ relatively high salaried physicians to do any work that can just as well be done by nurses who,

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*See 1913 edition of "Medical Inspection of Schools," pages 179 and 44 to 53, by Gulick and Ayres.

hour for hour, receive only about one-third to one-half as much remuneration.

The tests are chiefly the stop-watch and whisper tests, and common-sense is about the only standard. Children in outdoor life and in the school room should at normal distances be able to hear easily distinct speech lowly spoken; consequently whisper or low-spoken sentences will probably always be an important part of good testing. The Massachusetts tests as given in detail in the book just mentioned are the models which most of the other cities follow. Treatment is rarely recorded, largely because the defect is often permanent, and is generally treated, if treated at all, indirectly by treatment or removal of adenoids, defective teeth, enlarged tonsils, chronic catarrh, colds, discharging ear (otitis media), and the like.

The teacher's treatment of the child should, of course, be modified by reports of defective hearing; but the writer has found that this matter has been much neglected for frequently, and this is true of all ailments of school children, not enough attention has been given to notifying the teachers of the ailments and making it necessary and possible for them to readjust themselves to the children in the light of this new knowledge of them. Some cities send a record of every ailment immediately to the teachers of the individual children, and some, like New Bedford, Mass., have small room-filing-cases on each teacher's desk for this purpose. It seems a good plan for the child to take such a room card with him to the nurse or physician for each examination or inspection, carrying it in a fold of clean, blank paper for its protection, and having the physician or nurse record their findings on the card and write any special report for the teacher on the clean slip of paper. The records of nurse and physician could be distinguished by the nurse using, say, red ink in her fountain pen and the doctor, black. I know of no city following this plan; but it is these details which help most to bring about efficiency.

The percentage of defective hearing cases to total elementary or entire school population can hardly be made, for reasons given in connection with adenoids. In Summit, there were 12 cases among 1,034 elementary school children, reported as follows:

"Ears—The number of pupils with defective hearing or discharging ears was twelve (about 1 per cent). This is about one-half the number found last year, and is due largely to the correction of defects by medical treatment, or removal of adenoids and enlarged tonsils since the last examination was made."

How many cases had defective hearing only, we are not told. If there were eight serious cases, that were not merely temporarily defective because of bad colds, which is probably a big estimate, the percentage would be .7 of one per cent.

This caution is true for practically all nose, throat and ear ailments, the proportion of cases found being greater in the winter months when the children have bad colds. A room inspection of children in September will give a certain number of cases of adenoids, tonsils, defective hearing, discharging ear, and the like; and if the same children are again inspected in December or February a great many more cases will be found. Physicians and nurses who are most conscientious and intelligent in this work take care to distinguish between *temporary* and severe or chronic ailments.

The percentages for some of the cities are as follows (for elementary children only): Norwood, .9; Winchester, 1; West Orange, .3; Montclair, (16 cases), .5; Meriden, .4; Brockton, 1.8; Hoboken, .7; Trenton, .5; Newark, .6: in all an average of about .7. As these are cities where the tests were made for most of the elementary school children, we can see that the actual percentage is well *under one per cent.* Taking the figures as they stand, the percentage for New Bedford (414 cases) is over 3; for Rochester (628 cases), 2.6. These need not be taken seriously. The nurse at New Bedford for the year was new to the work, and had not a developed standard and the cases were first found by the teachers; while the work at Rochester was done by school physicians who evidently set the standard too low.

Although most investigations of this defect place it at *one* per cent of the children examined in the elementary school, the writer is convinced that *half that amount,* .5, *would be a truer statement of the actual number of cases where the defect was a genuine handicap* to the children; and that it would be better, as said, to report only these, and make adequate provisions for their special consideration and treatment.

4. DENTAL, OR TEETH DEFECTS

The reason for using the term "dental" instead of "teeth" is the same as that for using the words "eyesight," "enlarged" before tonsils, and "glands" before enlarged: for various administrative and other reasons these terms must be emphasized by position. Some of the most important school ailments can be given a forward place in the classification in this way, and physicians and nurses can easily learn to use this form of nomenclature when it becomes standard. An alphabetical order makes some terms, otherwise not so desirable, good for this purpose.

Defects of the teeth which require dental treatment and advice are among the most important of the ailments of childhood, both because of their frequency and because of their indirect effect on general health. Defective teeth might with truth be called "the great American disease" as the figures in these columns show. In any general summary of the ailments of childhood and youth, such as shown in the next table, defective teeth will probably always stand at the top of the list in the number of children affected. The figures given in these columns (58, 59, 60) represent for the most part the number of children affected, not the number of teeth decayed, or needing dental care. This is especially true of the doctors' cases. One case of defective teeth may give the nurse several inspections for toothache, "gum-boils," etc.; but on the whole each child with defective teeth has been counted but once.

The chief administrative and statistical problems to be considered in this rapid review of the table are:

a. Ratio of number of children with defective teeth to number of elementary school children, and number of pupils examined.

b. Percentage of children with teeth *seriously* defective.

c. Relative attention to teeth by Boards of Health and Boards of Education.

d. Percentage of cases treated.

e. Effect of treatment upon school progress.

All, of course, cannot now be answered.

The following quotation from the report of the medical examiner, Dr. W. J. Lamson, of Summit, in his June 30 report, 1911, will serve as an illuminating preface to the examination of these teeth columns:

"Teeth—Particular attention has been paid to the teeth, as their condition is of so much importance to the young child. It is deplorable to find that over 50 per cent of the school children have an unsound condition of the oral cavity —either decayed or unclean teeth. A pupil, for instance, with decayed teeth, is constantly absorbing poisons into the system. The glands of the neck try to protect the rest of the body, become enlarged, and frequently later become tubercular. The child is anemic, listless and unhealthy. Parents neglect to have such teeth filled or extracted, because the child is young. And yet it is of great importance to the child to have clean and sound teeth. One hundred and fifty-five cases were urgently in need of dental care, and their parents were notified. Each pupil was told the importance of oral hygiene and urged to use a tooth brush daily."

The nurse in her report, which largely omits statistics and gives only the personal side of the equation, also emphasizes the importance of caring for defective teeth because of their bad effect upon *digestion,* and strongly urges a dental clinic.

Here we find 552 children with defective teeth, as described, among 1,034 pupils examined, or 53 per cent. But only 155 cases were "urgently in need of dental care" and referred to parents for dentistry. This number is only 15 per cent of the total number of children examined, and but

28 per cent of the number of children with defective teeth.

The ratio of defective teeth to elementary school enrollment is 552 to 1,088, or about 51 per cent. For seriously defective teeth it is only 14 per cent.

How many *temporary* teeth are here recorded; why unreferred cases were recorded; why parents of all children with teeth defective enough to record were not informed; how many of the 155 received treatment that could be called cures, we are not told.

One other fact, only, is given: that "in school No. 1 where the higher grades (seventh and eighth) are located, 27 per cent of the scholars had defective teeth, as compared with 63 per cent for the rest of the schools."

This fact is true for all cities, that all ailments decrease with the age of the pupils from about the third or fourth school years, except defective vision. In Summit, the ratios of defects in the higher grades and in the lower grades were as follows: Adenoids, 1 per cent and 4 per cent; enlarged glands, 6.5 per cent and 11 per cent; defective vision, 21 per cent and 18 per cent; enlarged tonsils, 9 per cent and 12 per cent; vermin, 3 per cent and nearly 17 per cent (16.6). What Ayres, in his book on "Laggards in Our Schools," has shown to be true for his New York cases, is found true wherever studied. Most or all of childhood's ailments decrease with age except defective vision, which increases. Not a very great tribute to the hygiene of the schools rooms and teachers of America! For myopia is a *school* ailment.

DEFECTIVE TEETH IN SOUTH MANCHESTER

Here a "special physical examination was made of all pupils in the school system" in October, 1910. Of 1,725 pupils examined, 538 were reported as having defective teeth, a percentage of 31. We should expect a smaller percentage where high school pupils are included in the examination.

OTHER CITIES

Counting the number given by the nurse for *Norwood*

(984) we have a percentage of 62, or almost two-thirds of the elementary school population, according to the standards of the nurse and doctor. Here record was kept of 112 children who received dental treatment, about 11 per cent of those reported as needing it.

In Winchester, an excellent system of co-operation with the dental association has been worked out, but the nurse's report does not show it for the year put into this study. 717 children were examined by dentists with the aid of the nurse; and 84 of these were taken to the clinic and were treated at the small charge of 25 cents each. The 1910-11 report is better in this respect. The school dentists examined the teeth of 2,153 children and 1,665 cases were found defective, or about 77 per cent of the children. To the parents of 1,544 of these 1,665 children dental notices were sent, about 71 per cent of the number examined. The number who received treatment is not given, although 83 children received reduced rates at the clinic, or a little over 5 per cent of the referred cases (1,544). Little can be told from these facts. It is probable that dentists count too many very minor cases. The 1912 report states that in previous years "from 90 to 95 per cent of the pupils examined were reported as needing dental attention."

West Orange and Montclair quite evidently overlooked teeth almost entirely. Meriden physicians and dentists found 1,648 children with defective teeth among 3,621 pupils examined. Of these, 167 cases, or 10 per cent, obtained treatment (7 primary teeth and 160 permanent). Here we have (where "only the most obvious cases were noted," according to Superintendent Kelly, 1910-11 Report, page 33), 45 *per cent* of the pupils examined with defective teeth. The report goes on, "But more startling still is the indifference of many parents and their sympathizers." He urges dental clinics which would be patronized very generally, he thinks. A part of this indifference is due to the fact that the work was so new at this time, really getting started little earlier than the second month of the school year.

Some of the other percentages are as follows:

Newton, 2207 cases, on elementary school population, 5,987—37 per cent
Yonkers, 3063 cases, on elementary school population, 12,562—24 per cent

There were very probably many more cases than this latter number, because two physicians could not cover well the entire city. Part of the nurse's cases may be new cases not found by the physicians. Of these cases 1,235 cases are reported as cured, or about 40 per cent. The author's own careful summary of the reports of the physicians, however, showed only 1,631 cases of defective teeth; and only 12 cases of defective teeth were found in the nurse's reports; and yet the printed summary made by the nurse shows 2,474 cases and 662 treated. There is nothing in the monthly reports to back up these figures.

In Trenton, with a very much larger elementary school population, and 8 physicians working five days a week each instead of two, as at Yonkers *—in Trenton, with 713 school visits, or an average of 89 each, the number of cases of defective teeth found is only 3,276, or 31 per cent of the 10,587 children examined. Here the principals also report results, although some neglected it. Of 2,289 cases reported by them, only 633 (less than 6 per cent of the number examined) are recorded as being referred for treatment, or only 28 per cent. Of these only 13 are reported as cured, 76 improved and 292 not treated. These figures simply show that the work of seeing what was accomplished was not done, and emphasizes the experience bought dearly in New York and elsewhere that no cures, treatments, improvements, or anything of the kind should be reported without an inspection by the physician or nurse to ascertain that fact.

Notice of the excellent dental clinic in the City Hall at Trenton will be made in a later chapter.

*Where only 71 school visits were made by the two doctors in the year, about 35 each, 6 schools visited but once, 4 schools but twice, 3 but thrice, 2 four times, 1 five times, and 1 seven, 1 eight, 1 nine and 1 eleven times, not one of the 20 schools being visited by the physicians more than 11 times, and the average less than four visits each.

In *Waterbury* the Dental Association made a careful investigation of the condition of the children's teeth and have worked out probably the best statistical reports of teeth defects found in any of the cities. This report may be found in the 1910-11 report of the superintendent of schools and in later reports, and a complete summary for seven schools is here appended. In the annual report a separate report on the same form is given for each school. "The only cost to the Board of Education has been the furnishing of a dental chair and some other necessary apparatus, the whole expense amounting to less than two hundred and fifty dollars ($250)."

SUMMARY OF *DENTAL* EXAMINATION OF SCHOOL CHILDREN IN SEVEN SCHOOLS BY THE WATERBURY DENTAL ASSOCIATION IN 1910.

Grades.	2	3	4	5	6	7	8	9	Totals.	
Condition of the mouth—										
Good	256	389	279	351	236	233	137	126	2,007	54%
Bad	215	352	440	265	218	111	76	58	1,735	46%
Condition of the gums—										
Good	392	583	545	445	324	278	178	150	2,905	77%
Bad	83	178	172	160	129	64	33	34	583	23%
Use of the tooth brush—										
Yes	101	238	239	255	240	191	130	152	1,646	44%
No	362	522	361	357	221	152	83	42	2,100	56%
Teeth filled—										
Yes	58	64	93	92	100	74	57	51	589	16%
No	426	694	601	523	345	267	158	131	3,145	84%
Mal-occlusion—										
Yes	154	404	324	329	201	170	102	95	1,679	45%
No	327	456	373	286	251	173	105	87	2,058	55%
No. of teeth decayed	2,721	4,583	3,631	3,105	2,008	1,699	1,175	993	19,912	or 5.3 each
Total No. pupils	474	758	693	618	455	342	214	182	3,736	

Here, then, we have a table made by dentists themselves, and from it we can make the following more or less pertinent observations:

a. The number of children with bad dental conditions is astonishingly large. Among 3,736 children in all grades from the second to the ninth, inclusive, there were found 19,912 decayed teeth, an average of about 5 1/3 to each child. Unfortunately, we are not told how many *children* had defective teeth among the 3,736. The horizontal column marked "condition of the mouth bad" does not represent this number. Here we see that 1,735 children, or 46 per cent of those examined, had a bad condition of the gums or mal-occlusion, but some were counted good who had decayed teeth.

b. The figures are not accurate. The dentists evidently tried to place all the children in one of two classes for the first five items. If they had done so the sum of the two numbers for each item would be the number of children for the grade, given at the bottom. However, there is a fair degree of correspondence, the difference usually being slight.

c. The number of cases of defects is greatest in the *third* grade, with a few less in the second grade, almost as many or more in the fourth grade, and a gradual decrease to the ninth.

For bad condition of the mouth we have the following percentages of children defective:

Grades.	2	3	4	5	6	7	8	9	Totals.
No. pupils examined ...	474	758	693	618	455	342	214	182	3,736
No. defective...	215	352	440	265	218	111	76	58	1,735
Per cent. defective ...	45	46	63	43	48	32	35	31	 46

Counting all children who have decayed teeth or other bad condition of the oral cavity, we may conclude that probably not far from 66 per cent of our elementary school children are so affected, especially in the first years of medical inspection.

5. ENLARGED TONSILS

This ailment is quite closely associated with adenoids. We should expect to find more cases of it than of adenoids, because, as the superintendent at South Manchester puts it, "when the examiner found a well defined case of enlarged tonsils he did not take the time to make an accurate diagnosis for adenoids, for it is the custom of all surgeons who operate for tonsils to remove all adenoid tissue" (1911 Report, page 20). Enlarged tonsils are easily seen, while adenoids very rarely can be seen.* This fact should help to make our findings for enlarged tonsils more satisfactory than those for adenoids.

Let us turn our attention first, again to the actual and proportionate numbers of this ailment among the children here represented. In Summit, "there were 116 cases. . . . Of these only 39 were so much enlarged as to form a serious obstruction to breathing, and the pupils advised to have them removed. This was done in many cases." (Report, page 22.) Here is a percentage of the number examined (1,034) of 11.2 for all cases and 3.7 *for the serious ones.* No mention is made by either doctor or nurse of following-up pupils and parents to see that, or if, they procured treatment.

In South Manchester, of 1,725 pupils examined in elementary and high schools, 276 children had enlarged tonsils, or 16 per cent; 27 of the 276, or 9.7 per cent, had had operations before the report in June.

In Winchester, with an elementary school enrollment of 1,505 pupils, after several years of thorough inspection, 138 cases were found, or 8.5 per cent; and 62 of the cases, or 45 per cent, had operative treatment.

In Montclair, among 3,255 elementary children only 60 cases, less than 2 per cent, were found, but of these 37, or 61 per cent, had operations.

Some of the other figures, where known, are as follows:

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*Dr. Reik's helpful little book on "Safeguarding the Special Senses," F. A. Davis Co., Philadelphia, gives an excellent illustration of visible adenoids and tonsils, page 108.

ENLARGED TONSILS

	No. Elementary School Children Inspected or Examined.	Probable Number of Cases.		Percentage Defective.	Number of Operations Reported.	Percentage of Ailments Given Operative Treatment.
Summit Exams....	1,034	116	(39) 33.6% Referred	11.2	..	..
S. Manchester	1,725	276		16	27	9.7
Winchester	1,505	138		8.5	62	45
Montclair	3,255	60		2	37	61
Brockton	7,589	1,633		21%	125	7.7
Waterbury	12,077	130		1	"Many."	..
Yonkers	12,562	1,235		9.8	195	15
N. Bedford	11,739	713		6	31	4.3
Trenton Exams...	10,587	1,723	(510) 30% Referred	16.4	50	2.9
Cambridge	15,445	300		2	"366 home visits"	
Lowell	11,438	721		6.3	175	24
Rochester Exams..	15,157	4,452		29	Not separately given	
Providence	5,601	272		4.9	207	75
Newark Exams...	24,310	4,588		18.8	416	9
Boston	61,055	4,101		6.7	913	22.2
	195,079	20,458		159.6	2,238	275.8
				10.6 average		25. average
N. Y. City (1911).	230,243	34,639		10.7	9,808	28.

RESULTS

What conclusions can we draw from these variant facts? The average percentage of cases of enlarged tonsils, as compared with the number of children examined, inspected, or the entire elementary school enrollment, as the case may be, is 10.6 per cent, while the average percentage of these cases given operative treatment is 25. In Summit, where we are given the facts, only 39 referable cases were found among the 1,034 children examined, or 3.7 per cent, although the number of recorded or minor cases is 11.2 per cent. In Trenton, only 510 referable or serious cases were found among 10,587 children examined, or 4.7 per cent, although the total number of cases recorded makes a percentage of 16.4. These figures alone would lead us to suspect that the number of real, or serious, cases would not for all cities give a percentage as high as 10.6. From this and personal observation, I should say that each of the five figures above 15 per cent could be divided by two and a more accurate statement of the number of cases of enlarged tonsils obtained. One reason for this is that the examination covered only a part of the school population, while children were inspected from all parts. Likewise, it is believed, but cannot be demonstrated, that in those cities with percentages of cases less than 6, physical examinations, or even careful inspection for the purpose, would *increase* the figures up to six or more. These changes would make an average of a little over *eight* per cent. Half or two-thirds this sum would be near the number of serious, referable cases, perhaps.

As a general estimate and conclusion, we judge that not far from *eight* per cent of elementary school children have enlarged tonsils, and that about *five* or *six* per cent have serious referable cases which should probably have operative treatment. Probably half to two-thirds of these children would need to be operated on for adenoids at the same time.

Whether cities that have had medical "inspection" for some time are freer from this ailment than others not having had it, cannot be told from these figures. The average for the newer systems is below that for the old. Meriden and Jersey City, practically started in this year, have given few or no facts. Whether the older cities had found fewer cases each year is also difficult to determine. *Ideals* and *standards* for the work change. Generally, when a system is beginning, every slight deviation from the normal, if nothing more than a bad cold and a slight swelling of adenoids and tonsils due to it, is recorded, and children are *excluded* in great numbers for relatively trifling reasons. Gradually, the physicians and nurses see that they will get better results if they pick out only the serious and urgent cases; keep children in school as much as possible, even cases of pediculosis (nits) under treatment; and then make a good effort to get these important cases treated and cured. This seems to be the road toward maximum efficiency.

As to the Board of Health versus the Board of Education problem, we notice that the only cities giving no attention to this serious ailment of childhood are boards of health (Mt. Vernon, Newton and New Haven) with the exception of Jersey City. No board of health has what might be called physical examinations with individual health record cards, except Rochester. The only board of education city among three or four that have almost insignificant numbers of cases found is Montclair. With the exception of Rochester it can be said, in general, that even if they (the board of health systems) are much older on the average than board of education systems they are very much less efficient in this respect.

The proportion of school population seriously affected in one year is about 6 per cent.

6. DEFECTIVE VISION

Defective vision is very largely a *school* ailment. And here again the work is almost inextricably intertwined with other departments. In Massachusetts, Connecticut and to a large extent in New York, vision tests are conducted by teachers and principals. In several places the nurse does the testing, in others the physician, while in others the physical training teachers help. This shows again the need of one integrated Department of Hygiene in a school system under one director where we now have the following scattered and uncorrelated agents: doctors, nurses, physical training teachers, playground instructors, open-air school teachers, dentists, sanitary inspectors, etc. Perhaps in many cities, as at Summit and Brockton, the nurses can be made also truant officers. Why not do this work while very probably at or passing the home on regular nursing visits?

No very definite and fixed standards for testing the vision were found. There are so many persons doing the work, even where each principal of a school tests all his own pupils, that the results must be taken with reservations, and comparisons made only with great care. The Snellen test charts are the ones principally used. Some call all vision less than 20/20 defective; others, less than 20/30; and all use their judgment in referring cases showing signs of eye-strain, even though 20/20 may be easily read. The Massachusetts directions for testing, as given in "Medical Inspection of Schools," by Gulick and Ayres (1913 edition), page 45, are also commonly followed. The great number of such cases declared negative, or not needing glasses, after examination by oculists throw doubt, however, on the 20/20 or 20/30 standards. It is normal for there to be some variation in the vision of children; indeed variation is the most characteristic thing about children. This whole problem needs investigation under competent supervision. Perhaps 20/30 or less, as used in Newark, would be a better division line. We recommend 20/40, unless there are other serious symptoms of eye-strain.

The Providence Board of Health has a school oculist who gives a very detailed report of his findings, but not of his methods, in the 1910 report. He devotes two mornings a week to the examination of children referred to him by the school doctors. His salary is $500 a year. Free prescriptions for glasses are given all needy children. We need free prescriptions by the best school oculists for *all* school children.

In Summit we find the following report by the physician: "Eyes.—While the total number of cases with defective vision and various other diseases of the eyes is rather in excess of last year (194 and 185), yet more than one-third of this number is made up of last year's cases, which are almost all being treated by properly fitted glasses. It is gratifying to note that when attention is called to the need of correction of defective vision, the parents as a rule attend to the matter promptly. Two cases of severe, chronic trachoma (granulated lids) were operated on, with complete cure. One pupil, 16 years old, had such bad eyesight that he could only see letters at fifteen feet distance which he should have been able to see at eighty feet. There was a constant eye-strain and twitching of the lids, which was completely cured by proper glasses, and his vision, by their means, is now normal. Some pupils, by wearing glasses for a time, have had their vision so much improved that glasses are no longer necessary, and the accompanying eye-strain, school headaches, watery eyes, etc., have disappeared. In all, eighty-five new cases of defective vision were advised to consult an oculist." The nurse reports having "spent twenty-four afternoons at Dr. Vaughan's, the eye specialist's, with children whose eyes needed attention."

The facts for defective vision, as nearly as they could be obtained, are as follows:

DEFECTIVE VISION

	No. Elem. children examined.		Probable number of cases.	Percentage.	Number obtained glasses.	Percentage of number of cases.
Summit	1,034		194	19 (8)	*a*	*b*
Norwood	1,571	El. Pup.	60	3.8	5	8.3
Winchester	1,505	El. Pup.	220	15	70	29
Montclair	3,255	El. Pup.	51	1.5	47	..
Meriden	3,621	Exam'd.	..	..	75	..
Hoboken	8,773	Exam'd.	247(1457)	3 (17)	82	33
Schenectady	10,121	El. Pup.	562(6568)	5.5(8)	21	3
Yonkers	12,562	El. Pup.	676	5.4	212	31
New Bedford	11,839	El. Pup.	637	5.4	..	..
Trenton	10,587	Exam'd.	619	5.8	67	11
Cambridge	15,445	El. Pup.	194	1.2	14	7
Providence	31,946	El. Pup.	685*	2	250?	36?
Newark	24,310	Exam'd.	3003	12.4	989	32
Boston	61,055	Insp'cd.	2000	3.3?	1742?	87?
Sum.				82.8		277.3
Average				6.4		28

*a*85 referred. *b*"Almost all." *491 prescribed glasses. ?Treatment.

Here again records are such that scientific data are hardly obtainable, and generalization must proceed cautiously. On the stand that only referable cases should be reported, Summit would have a percentage of the number of elementary school children examined of about 8, instead of 19. The same would probably hold true of Winchester and of Newark. Very low figures below 4 are probably due to the fact that there were visual examinations made of only a part of the elementary school population, those referred by teachers, and those who were found by a partial routine examination. The percentages of cases found here are smaller than those usually given.

From my observations, and from these data, I am convinced that most of the high percentages given in reports of medical inspection are *unnecessarily alarming,* since they really mean little when carefully analyzed. They are practically always based upon the number of cases found by the standard used, and not by the number of cases referred for treatment, which is nearer the actual number of genuine cases. Many of the latter even are only "suspected" cases on which the parents are advised to obtain advice. More confidence must be placed in careful examinations, but even these vary considerably in the above list. Where physical examinations were made, as in the case of Newark, of only part of the elementary pupils, and cases referred for vision tests from among the non-examined children, we must lower the percentages.

As a final judgment, I should say that the average given above is not very far from the actual percentage of elementary school children with this defect, when the examination has covered all grades. Perhaps not far from 7 *per cent* of elementary school children will be found to need glasses as a remedy for their defective vision. This would mean two or three children in each school room. The number will be found to increase with age. This estimate is practically that made by eight ophthalmic surgeons who by special appointment examined 2,000 school children in London in 1904.* Their examinations demonstrated that about 7.3 per cent of all children in the elementary schools suffer from 20/60 or worse vision. The percentage near 20/40 and less was 12.6. This last seems to be about the standard used at Newark, although in reality it is given as 20/30.

The relative numbers of cases of various kinds are given in great detail in the 1910 report of the Providence

*Cornell, page 579.

Board of Health, of which the following is a section with percentages computed:

Vision	Number of eyes	Percentage
20/15	12?	10
20/20	201	16
20/30	243	20
20/40	167	14
20/50	95	8
20/70	162	14
20/100	159	13
20/200	127	10

There were 685 cases which had been found by teachers, nurse and physicians; and for these the oculist prescribed 491 pairs of glasses, or nearly 72 per cent. Ten eyes (not children) were found with a total loss of vision; and 28 children with supposed defective vision were found to be only *illiterate.*

The question of whether vision testing should be done only by oculists has not been scientifically answered. Practically, doctors, nurses, and teachers in the various cities simply find the cases which, according to rough estimates, should receive examination by an oculist. Until we have clinics which will furnish prescriptions and possibly glasses at public expense, as school books are now furnished, the present system will probably be best. Another alternative is to do as Providence has done in supplying accurate diagnosis with prescriptions for glasses to all who desire it, and are recommended by the nurses, and glasses to those only who are unable to pay for them.

The nurses have been very successful in many cities in helping needy children to obtain glasses. In practically every city there are numerous individuals and organizations that are glad of the chance to furnish glasses to the children of needy parents. In Lowell, Superintendent Whitcomb has for years furnished needy children with money for glasses out of his own pocket. Such sacrifice is needless, and stands in the way of acquainting the public with school problems and school needs. The numerous ways devised by superintendents and others in obtaining assistance along a great variety of health lines without school expenditure and with benefit to the public, as found in a number of the cities visited, almost leads to the conclusion that a superintendent can get almost anything he wants for the schools free of charge, if he knows how to mould public opinion and reach the people who desire to give services or money or both to some worthy cause. Denison's book on "Helping School Children" (Harper's) is full of illustrations of this principle, and points out an almost unworked field before us.

BOARDS OF HEALTH VS. BOARDS OF EDUCATION

What does the comparative treatment of defective vision in the schools show as to the relative efficiency of Boards of Education and Boards of Health? Of four cities giving no attention to this very important school ailment, three were board of health cities. In New Bedford, where the doctors but not the nurses are under the Board of Health, the former have practically neglected this ailment, finding only five cases to the nurse's 632. There is good excuse for this perhaps in that teachers are required by law to make such examinations in Massachusetts. This would practically excuse, also, the other boards of health in other cities, for this ailment. By far the best report on this subject is found in the report of the Board of Health of Providence, and the 1911 report is still better.*

In the cities given in the above table, however, where boards of health have attempted this work, we could compare the two forms of administration on the following bases for which we have data:

a. Percentage of elementary school children examined for vision.

b. The percentage of cases found.

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*In general, the reports on Medical Inspection by Dr. Charles V. Chapin, of this Board of Health, are in many ways quite superior to those of many or most other cities.

c. The percentage of cases procuring glasses, or other treatment.

The quality of the work done in examination cannot well be put in the form of a numerical coefficient, although we could say that the examinations of the oculist at Providence were undoubtedly better than those in other cities. The amount of work is shown to some extent by the number of cases found; for those cities reporting percentages less than three or four of the elementary school population, certainly did not reach all the children. Six cities fall below four per cent, 3 under the boards of health. But there are, in all, 9 board of education cities to 6 board of health cities, and one of the latter, Boston, is partly administered by the Board of Education. This would give the advantages to the boards of education, the percentages falling below being about 33 for the boards of education and 50 for the boards of health. Both Boston and New Bedford, especially the latter, are lifted up by the school nurses in the department of education.

The three cities with *high* percentages are all board of education cities. These higher percentages may not be virtues where discretion has not been used. In these three cases, however, I think they represent careful, painstaking work with a large percentage or all of the children.

GLASSES

Little can be judged from these figures. The average percentage of cases treated or cured by glasses for the ten cities reporting is 28. The average for the board of health cities is 11 per cent, while the average for the boards of education is 33. Boston is here counted as a board of education city for this function, since the nurses reported 1,581 cases to the doctors' 617, and were the ones who got the treatments and recorded them.

The following conclusion can probably be drawn legitimately from these facts:

As a rule, these boards of health are less efficient than are these boards of education with respect to finding cases of defective vision, and especially in obtaining and reporting cures.

Providence stands out as an exception.

1911 REPORT OF THE PROVIDENCE OCULISTS

This leads us to add some further facts from the last Providence report on this problem of finding and curing defective vision.

Two oculists are now employed (1911 Report) two afternoons a week for about two hours each afternoon at the Fourth Ward Room for examining eyes, at salaries of $500 each. All pupils who are found with defective vision in the schools by teachers or nurses may now go to these oculists for free examinations and prescriptions for glasses, or medical treatment. One oculist has reported for only a half year. Together, there were 646 cases, for whom were prescribed 496 pairs of glasses (77 per cent) and of whom the nurse saw 420 and obtained or reported 339 as "having treatment," which if we were to interpret as meaning glasses, would be 68 per cent of the number prescribed glasses, and 81 per cent of the cases seen by the nurse. A small percentage of the cases needed medical treatment. Two possible fallacies lie here: There were probably many children with defective vision who did not go to these oculists, so the percentage of cases treated was probably much smaller, and, second, treatment may mean glasses in only a small percentage of cases.

This illustrates again the common failing to give the facts upon which estimates can be made, even in the best reports. (Our estimate of children needing glasses or an operative treatment is seven per cent.)

7. STRABISMUS, CROSS-EYE, SQUINT

This is a vision defect which is emphasized by separation from the others. Dr. Reik, in his "Safeguarding the Special Senses," expresses sound medical experience when he says, that "practically all cases of crossed eyes, even of many years standing, can be rectified, and when one considers what a difference in personal appearance it makes, the disagreeable effect of such an eye upon those who must come in contact with the afflicted person, and the simplicity of the operation, it looks like a sin against the community to allow such persons to retain their deformity" (page 46). The ailment is only the failure of the eyes properly to co-ordinate because of muscular or refractive errors, and the giving up of the struggle to use both eyes together. One only is used, and if the other is constantly neglected through habit or other cause it frequently goes blind. So this ailment, which is quite commonly neglected, should be given special attention in early school life, or before, whenever the nurse or teacher finds such a case among the little children in the homes.

Some cities did not keep separate records of this ailment, and several did not record the ailment at all. There were two cases in Summit among 1,034 children. Waterbury had 89 cases in an elementary school population of 12,077, a much larger percentage, but little less than one per cent (.7).

Yonkers reports 47 cases found by the doctors.* Taking 47, we have a percentage of the elementary school enrollment of .4. Taking the several cities, and using the nurses' figures for Cambridge and the physicians' in Boston as is reasonable, we have:

	Children.	Cases.	Percentage.
Waterbury	12,077	89	.7 (7 in 1000)
Yonkers	12,562	47(25)	.4 (.2)
New Bedford	11,839	221	1.8 (18 in 1000)
Trenton	12,774	26	.2
Cambridge	15,445	95	.6
Providence	31,946	100†	.3
Boston	95,970	173‡	.2
			4.2

Average .6, or 6 in a 1000.

†Oculist. ‡Perhaps more.

Leaving out New Bedford with its high figures, we have a percentage of .4, or four in one thousand elementary

*Our summary of the doctor's reports shows only 25 cases; while the nurse reports 12 cases treated, while our summary of her reports shows only 6 cases.

school children. Nothing has yet been brought out to show whether the ailments of any kind vary much with place and length of time these medical inspection systems have been in operation. Our estimate is about seven cases in a thousand.

Very few of these cases are reported as having had treatment, operations, or glasses. This is due only partly to inefficiency. Physicians and nurses are frequently not sure that it is necessary or their province to follow-up thoroughly all cases to see that they do obtain the care they need. A later chapter will show that they do not get results amounting to very much without thorough follow-up work, and it is apparent that neither tests of efficiency nor adequate knowledge of health facts can be obtained without satisfactory records of the most important matter in all this work, *cure and prevention.*

(Our estimate is 7 cases in a thousand.)

8. GLANDS ENLARGED, ADENITIS, TUBERCULAR LYMPH NODES

This is another ailment quite common to children and which may lead to serious consequences, the least of which may be, if Ayres' findings * are true, serious *retardation* in school, amounting to a loss of 1.2 years in passing through the elementary school. Other causal factors operate, however, with such cases and we are not sure that the retardation may not have been due in whole or in part to poverty, bad heredity or some other associated cause. Verification of such studies lies in the future.

Malnutrition, bad ventilation, and decayed teeth are named by physicians as causes of this ailment, though they give but little scientific proof of their conclusions. One very clear route of travel to adenitis seems to lie through the following steps: decayed teeth, enlarged tonsils, adenoids and indigestion, then enlarged glands. Frequently the route is also up the eustachian tubes to otitis media, or discharging ears and deafness. The glands may also become tubercular

*Laggards, page 128, and the 1913 edition of Medical Inspection of Schools, page 161.

and consumption may follow. The mouth is the portal. Much of medicine, as of education, is, however, yet a matter of mere hypothesis.

So few of the gland cases are recorded as treated or cured that a separate column is not given to these data in the table. Something of the frequency of the ailment may be gleaned from the data below:

ENLARGED GLANDS

			Cases.	Percentage.	Referred.	Reported Treated.
Summit	1,034	Exam'd.	103	10.0	..	..
S. Manchester	1,725	Exam'd.	2	.1	2	..
Norwood	1,571	El. Pup.	8	.5	8	..
Winchester	1,505	El. Pup.	18	2.3	18	..
Montclair	3,255	El. Pup.	25	.8	25	10
Hoboken	8,773	Exam'd.	5	.0	5	..
Schenectady	10,121	El. Pup.	29	.2	..	..
Waterbury	12,077	El. Pup.	114	.9	..	..
Yonkers	....		3	.0	..	..
New Bedford	11,839	El. Pup.	15	.1	..	..
Trenton	10,587	Exam'd.	10	.1	10	..
Cambridge	15,445	El. Pup.	30	.2	30	..
Syracuse	18,016	El. Pup.	39	.2	..	..
Rochester	15,157	Exam'd.	1281	1.2	..	..
Providence	31,946	El. Pup.	70	.2	..	..
Newark	24,310	Exam'd.	4147	1.7	..	..
Boston	61,055	El. Pup.	700	1.1	..	..

Average 1.2 per cent for 15 cities. 28.6 per cent.

Here we have percentages of this ailment far below on the average those usually given. In the controlled investigation by Ayres in 1908 previously mentioned, among 7,608 children medically examined, a percentage of 40 *per cent* were found suffering from enlarged glands in the six-year group and 7 per cent in the 15-year age group. The percentage for all is not given. Among 3,304 of those above the age of nine especially studied, over 13 per cent had enlarged glands; and when they were divided into three classes the percentages were as follows: Dull, 20; Normal, 13; Bright, 6.

None of the figures in these twenty-five cities approach very closely to this average. The conclusions which might be drawn to account for this discrepancy are:

a. Summit and Newark were the only cities which made very thorough examinations of the children. There is some truth in this.

b. These cities have not found all the cases. There is also some truth in this.

c. The New York children are more afflicted with this ailment. I doubt whether there is very much truth in this.

d. The New York physicians found more cases than there were, or called very slight deviations from the normal, *enlarged* glands. If there is much truth in the last hypothesis, Ayres' findings rest on a very unstable basis. The time is not ripe to be dogmatic in this field.

In the entire city of New York in the school year of 1910-11 among 230,243 children examined, only 483 cases were found, a percentage of .2, the average above given. The 1912 monograph on "The Division of Child Hygiene," of the Department of Health of the City of New York, shows also no great variations by ages, as shown on the chart, part 82. The percentages for 1910 and 1909 are practically .3. These figures throw more suspicion upon the accuracy of the Ayres' data.

What general statement of the prevalence of this defect can we derive from the above data? Some cities apparently found, or at least recorded, no cases at all. One would not expect to find a high percentage of these cases in Summit, it being probably one of the most healthful and generally well-to-do of the cities, a suburban resident town. There seems, however, to be little sociological basis for the variations, the mill towns and others with congested foreign population not standing very high, comparatively. The length of time medical inspection has been in force seems to make no difference. The difference must lie more in the standards, requirements, and interests of the men and women making the examinations and inspections.

Special studies in England of some 10,000 children place the percentage of cases below one per cent as in most of the cities in this investigation.*

The number of cases in Summit was very much smaller the year before the above report, the exact figures not being given; but among 950 pupils examined there are only 91 (about 10 per cent) miscellaneous cases of "anemia, malnutrition, coughs, colds, nervous affections, *glandular swellings,* etc." Undoubtedly, the percentage was very low; and yet the Ayres' figures for the retarding effect of glands are given in the same report. In the later report studied, 1910-11, the doctor says in his report, "Glands—Particular attention was paid to enlarged glands of the neck. These usually accompany decayed teeth and are apt to break down, or become tubercular unless prophylactic treatment is given. There were 103 cases." None were referred according to the following statistical table in the report. This is a glaring example of a point made by the writer on a former page, that *physicians find what they give "attention" to, what they look for;* and the Summit physician is quite above the average medical inspector.

Discounting, then, very much the Summit percentages, we have Newark to consider. The previous report shows a percentage of 16 for this defect. My judgment is that very slight deviations from type for this defect are recorded, rather than that the children are especially ailing in this particular. Then, too, many children not among the 24,310 examined, undoubtedly furnished cases. The probabilities are that the true percentage is not above *four per cent* at most. Trenton and Rochester both had physical examinations and their percentages are only .1 and 1.2.

Taking a number of such facts into consideration we should estimate that the actual number of cases in the elementary school populations serious enough to warrant attention and preventive or curative measures is around *one per cent,* as a fairly generous estimate. Not until there is some

*1910 report of the Chief Health Officer of the English Board of Education, pages 53 and 54.

adequate standardization of reporting this and other ailments through the training and supervision of physicians and nurses will there be much correspondence among reports.

9. HEART DEFECTS, HEART DISEASE, CARDIAC AILMENT

The 1911 report of the Board of Education of England above mentioned summarizes the situation here with respect to this ailment, in the following words: "As far as can be judged from the attention bestowed on this subject in the reports of School Medical Officers, it does not appear as yet to have aroused widespread interest or to have formed the basis of many special inquiries" (page 54). We have nothing in America comparable to this report, however. The percentage of children affected seems to be about *one* per cent.

Without placing here all the figures, the reasoning and the guessing necessary, we shall give in this and several other cases only the probable frequency of the ailment, with the variabilities.

Some of the cases are: Summit, .3 per cent; Boston, .2 per cent; Rochester, .5 per cent; Newark, 1 per cent; Trenton, 1.1 per cent; Hoboken, 1.4 per cent. In New York City in 1911, the percentage is .7. The average for our cities is less than .7.

Discounting for recording very minor cases, and adding for the cases missed, we judge that the number of the various kinds of heart defect needing attention and treatment is between .6 and 1.2 per cent, say .9, *to name a figure.* With better education in this respect, and all examinations made with the pupils' chests stripped, the percentage of real cases will probably rise to *one per cent.* Most cities do not have the latter necessity for adequate heart and lung examinations.

10. LUNGS WEAK, NOT TUBERCULAR

Some children are flat chested, weak lunged and predisposed to pulmonary troubles, but not yet infected with tuberculosis. They need good ventilation, physical training in the form of plays and games and probably medical gymnastics, light work, good food and general care. These are the ones who are anemic and debilitated, and frequently, if not always, profit in an open air school. We can tell little about the frequency of the defect. Depending again largely upon cities that have physical examination, we have an average percentage of about .5 or a half a per cent, *five cases in a thousand.* This is only a guess because the defect cannot be well defined.

11. MALNUTRITION, DEBILITY, INDIGESTION, GENERAL CONDITION

These ailments are not well differentiated, but they are not separated well in the reports. Debility and indigestion may have little or nothing in common with malnutrition. The latter term is most commonly represented in this column, however.

The percentages for some of the cities are as follows: Summit, 1 per cent; Norwood, 1 per cent; Montclair (many cases of "general condition"), counting 124 cases, 4 per cent; Hoboken, .05 per cent; Waterbury, say 30 cases, .2 per cent; New Bedford, .4 per cent; Trenton, .4 per cent; Cambridge, .1 per cent; Rochester, 5 per cent (these doctors also visit those families who are ill and in poverty; and this may account for the attention given to malnutrition); Providence (100 cases), .3 per cent; Newark, 2.6 per cent, and Boston (counting 800 cases), 1.3 per cent. The average is 1.3. The median is 4 per cent.

There are undoubtedly very many more cases of under and poorly fed children in many of these cities, as could be easily determined on investigation, probably as many as six or seven per cent in some cities with more poor and more foreigners than Rochester. This problem very much needs scientific study, and school systems very much need adjustment to the situation as found. England is far ahead of us in this particular. Both the 1910 and 1911 English reports mentioned give able treatments of this matter. Among about 200,000 children examined * in counties and urban districts, approximately 20 per cent were regarded "good"

*1911 Report.

as to nutrition, 69 per cent "normal," 10 per cent "subnormal," and a little less than *one* per cent as "bad." These percentages are based upon the medical judgments of the physicians. Attempt at objective standardization of the examination is being made in the relationship to height and weight, pages 27-29.

A "nutritional index" was worked out, namely: Index equals 100 times the cube root of the quotient of the weight in kilograms divided by the height in kilograms.

The average value of this index for each year of school age from three to fifteen for 9,166 children examined was determined, and these standards used for measuring the nutritional condition of various groups of children, with fair results.

The London County Council publishes a book largely given over to the problem of meeting the malnutrition situation (Handbook Containing General Information with Reference to Children's Care, second edition, R. Blair, Education Officer, London).

In our own country, and among these cities studied my judgment is that *not far from two per cent* of the elementary school children are suffering enough from malnutrition to need special care and treatment. In New York City, the percentage is from 2.5 per cent to perhaps 3.5 per cent.

12. DEFECTIVE MENTALITY, BACKWARD CHILDREN

Only half of the cities mention this serious defect. Providence has since employed a neurologist for the examination and study of such cases, but further than that there seems to be no specialization of this function as at Cleveland, Los Angeles and other places.

Some of the percentages of this ailment are as follows: Summit, 1 per cent; Norwood, 5.4 per cent; Winchester, .1 per cent; Montclair, 1.5 per cent; Schenectady (47 cases), .5 per cent; Waterbury, .1 per cent; Trenton, .1 per cent; Cambridge, .1 plus; Providence, .2 per cent, and Newark, 1.4 per cent. The average is for these ten cities, .9. This is practically the number found in Cleveland by the psychiatrist with the help of the Binet tests, but according to the 1911-12 report, page 3, *"falls far short of the total number in the public schools."* A distinction is made between the feeble-minded and the mentally defective children, "the epileptic children should also be included in the group to be *eliminated"* from the schools. This would raise the percentage for Cleveland (750 cases and 41,514 examined by doctors) up to 1.8 per cent. Dr. Holmes of Newark also urges the elimination of all such children from the schools. Dr. Goddard in his investigation of this problem for the School Inquiry Committee, concluded that there are at least 15,000 feeble-minded children in the public schools of New York City, about 2 per cent. These are children "so mentally defective as to preclude any possibility of their ever being made normal and able to take care of themselves as adults." This is also the percentage found among 2,000 children in the little town of Camden, N. J.*

Our judgment for these cities is that the actual percentage of mentally defective children in the elementary schools is *not far from one per cent.*

13. NERVOUS AILMENTS, CHOREA, HABIT SPASM, NERVOUS EXHAUSTION

There are a number of ailments of the nervous system which are frequent among children, and important from the educational point of view. These are well treated from the medical point of view by Cornell and Hoag in their books on "Medical Inspection" and the "Health Index." We are concerned here principally with their frequency and administration. Some of these ailments connected with speech, sex, etc., are treated in other columns. The principal ones here are chorea, or St. Vitus' dance, a nervous twitching of various muscles of the neck, face, head, shoulders, arms and legs. Dr. L. D. Cruickshank, in his most excellent "Sixth Annual Report on the Medical Inspection of School Children in Dunfermline," Scotland, says it is "re-

*See *Pedagogical Seminary* for June, 1911, "Two Thousand Children Tested by the Binet Scale," by Henry H. Goddard.

garded by some as a manifestation of rheumatism and as such requires special care in order that no damage may result to the heart. Children should come under treatment as soon as the choreaic movements are detected. Continuance at school is harmful even when the symptoms are slight in character."

Nervous exhaustion is found more particularly among the girls in the upper grades and high school. Nervousness, excitability, and peculiar nervous habits all come under this list. Epilepsy is included, but would not have been had there been many cases reported (13 in Boston). A few other ailments have very small representation. The chapter by Dr. Cornell in his book, pages 324 to 358, is probably the best school discussion we now have of the trouble. Reports from some of the cities are as follows:

Summit	8 cases, a percentage of about	1 per cent
Montclair	20 cases, a percentage of about	.8 per cent
Hoboken	4 cases, a percentage of about	.04 per cent
Brockton	17 cases, a percentage of about	.2 per cent
Waterbury	6 cases, a percentage of about	.06 per cent
Trenton	8 cases, a percentage of about	.07 per cent
Cambridge	14 cases, a percentage of about	.09 per cent
Providence	134 cases, a percentage of about	.4 per cent
Newark	77 cases, a percentage of about	.3 per cent
Boston	130 cases, a percentage of about	.2 per cent
		3.17

Average, .3 per cent. Median, .3 per cent.

The percentage in Dunfermline is .4 per cent. In New York City, the percentage is also .4 per cent. Better medical examination and inspection in our upper grades and high schools will undoubtedly raise this percentage. My judgment for the elementary schools of the cities is that its frequency is *at least .5 per cent.* Dunfermline has more careful work than any public school system in this country, probably, but its examination system is so arranged that all pupils are not examined each year. If the whole school system were covered each year by thorough examinations, the percentage would probably be raised. For *serious* cases, the percentage is probably *less than .2.* It can be seen from this that many cities have not found the cases. When the attention of medical men and nurses is drawn to the importance of this ailment and its prevention, the figures will very rapidly climb up.

14. PALATE DEFECT, CLEFT PALATE, ETC.

Cleft palate is associated with hare lip. The high, narrow palate is associated with enlarged tonsils and adenoids. Fortunately, the ailment is uncommon, only seven cities mentioning it, and three of this number with only one case. It might be placed with the Orthopedic defects, or "Deformities." The percentage for Cambridge is .05; for Rochester, 1.7; and for Newark, 1.7. It is not mentioned in either Boston report. The average proportion is probably *seven cases in a thousand.*

15. SKELETON DEFECTS, ORTHOPEDIC, DEFORMITIES.

Spinal curvature (scoliosis), round shoulders, and the like, are given separate space in the next two columns (89 and 90), because of their importance in school life. In certain cases spinal curvature was given with other deformities and is here included. They should be kept separate. Pigeon breast, caused, like scoliosis, quite largely by rickets in infancy, wryneck, webbed fingers and toes, flat feet, and a number of others come in *this* list.

The frequency is about .2 per cent, or less.

In the case of this and the following group of ailments we have the province of medical gymnastics, or therapeutic exercises. In the School Clinic at Dunfermline, previously mentioned, there is a separate division with an expert in charge for all such work. Through massage, carefully guided exercises, and general hygienic regimen much which cannot be surgically or medically cured, can be helped, and improved.

16. SPINAL CURVATURE, POSTURE, ROUND SHOULDERS, FLAT CHEST

The lack of sufficient medical examiners and the peculiarities of public opinion, or public sentiment, are such that genuine, all-round physical examinations are not yet being made in American public schools. To discover and study such defects as are here listed means the removal of the child's clothing, or at least stripping to the waist. This is now practiced in the best private and normal schools, and colleges. A very few cities are introducing such examinations in the high schools; and some courageous medical examiners go ahead and do their work in a thorough way in the elementary schools. In certain or all cities there are school districts in which anything necessary for scientific work can be done, and in others, generally the richer and supposedly more enlightened, the policy is more that of "hands off." Yet the children of the latter are frequently the ones who need most attention of this kind.

The frequency in the elementary school population is perhaps *not far from* .8 *per cent, and perhaps one per cent.*

Dunfermline has 2.2 per cent well marked cases of spinal curvature (97 cases and 4,492 pupils examined). Evidently here there were adequate examinations, slight deviations regarded perhaps, and a greater prevalence than in this country; although we may have more cases than even one per cent.

Fundamental prevention of this ailment must begin in the child's infancy through the preventing of rickets and such ailments.

17. SPEECH DEFECTS, STUTTERING, STAMMERING, LISPING, LALLING

Stammering or stuttering is the commonest of these ailments. "The condition is commonly the result of imitation, and this gives rise to a difficulty in treatment, because stammerers are likely to increase each other's defects when placed in special classes." These words by Dr. Cruikshank may be too strong against class treatment; for pupils imitate and start the habit only when they think it is *smart,* but when there is a good deal of social disapproval or stigma upon it, the danger of imitation seems to be slight. The new book by Professor Scripture on "Stuttering and Lisping" marks an epoch in the scientific diagnosis, treatment and prevention of this distressing ailment.

Only 433 cases were reported by the physicians in all the cities.

In Newark, the percentage of such cases among the children examined is nearly 1.7. In Dunfermline, the percentage is about the same. Exceedingly few cases are mentioned in the 24 other cities outside of Newark. Probably *less than one per cent* are affected the country over. We place it .9 *per cent,* to give it definiteness.

This concludes physical defects according to our classification. A later table will show the percentages for all the ailments, and the probable number of cases among the elementary school children in all the cities taken together, and comparing them with the cases actually reported.

There are undoubtedly very interesting and important individual variations among the cities in the number of cases of the various ailments actually existent; but the personalities, standards, equipments, and methods of the workers in the school health service are at present so varied that the real *health* variations can hardly be disclosed. This remains for the future. Summit, Winchester, Montclair and other cities of a suburban character should show very different findings from Lowell, Hoboken, Jersey City New Bedford and foreign factory cities generally. Such sociological differences do not as yet appear.

CHAPTER SEVEN.

COMMON NON-INFECTIOUS AILMENTS

B. Common Non-Infectious Ailments

1. ABSCESS, BOILS, ETC.

This class of ailments is very infrequent and perhaps should be placed with wounds, sores, etc. If properly cared for by the nurse, boils, carbuncles and other similar infections may easily be classed with the other first-aid treatments. Separate place is given here because it is mentioned separately so many times in the reports of 12 cities. All persons who have had these troubles can sympathize with the children and realize that their lives can be filled very full of suffering from such infections. The percentage of cases is very low, probably near .2 per cent. Boston reports 314 cases, or .5 per cent of the elementary school enrollment.

2. ACUTE SORE THROAT

Sore throat is quite common among children and as a term is better than more technical ones. Perhaps both laryngitis and pharyngitis, mentioned practically only by board of health physicians, could also be included in this term, although, in general, accuracy of diagnosis and detailed statement mean more scientific procedure.

Sore throats are so closely associated with a number of infectious diseases that in some towns, such as Montclair, the nurse makes a practice of taking a swab from the throat of almost every child severely affected. The child is first temporarily excluded; the nurse goes to the home with the child, takes the swab, and instructs the mother in the care of the child. When the culture has been made at the drug store or Board of Health office, the nurse knows whether the child should be excluded and turned over to the Health Department as a diphtheria or other case. Nothing less than this procedure seems to be sufficient to exclude incipient stages of several ailments which may easily become centers of infection, out of school if not within. (The researches of Dr. Chapin at Providence make it doubtful whether there is very much spread of infection at school, 1911 report.)* The frequency of the ailment will probably vary, as will most of the ailments in this class, more than the physical defects, which seem to be remarkably constant, depending more upon the weather, home and school ventilation, and the like.

The percentage of cases during the school year is probably *near* .2. Boston has .5 and Newark .05 per cent.

3. BRONCHITIS

This ailment is quite infrequently reported or found. Less than half of the cities mention it. Generally the case is not found in school, and is only reported after the child has returned. It seems certain that an adequate and scientific administration of this work will, by the way, necessitate fairly complete health histories of the children *in* school and *out*. The child who is absent with bronchitis, for example, should be visited by the nurse and inspected on his return and a record of the ailment made. Common ailments are now much neglected. If the school medical service is ever to develop into what it should become, a *preventive* as well as a *curative* agency, the causes as well as the cases of all these common ailments which so much lower the vital efficiency of children will be matters of careful study.

The frequency of bronchitis is as follows: Boston, say, 300 cases (for the nurses undoubtedly found a number of new cases), .5 per cent; Lowell, .2 per cent; Trenton, .1 per cent, and the others less.

The frequency is at least .1 *per cent*.

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*See also Professor Jordan's article in the 1912 N. E. A. report on School Diseases.

PHYSICAL DEFECTS.—*Continued.*

	Spine: Curvature and Posture, Round Shoulders. M.D.	Spine: Curvature and Posture, Round Shoulders. Nurse.	Speech: Stuttering, Impediment. M.D.	Speech: Stuttering, Impediment. Nurse.	Totals for Physical Defects. M.D.	Totals for Physical Defects. Nurse.
	122	123	124	125	126	127
1.	...	...	10	...	1,069	4
2.	...	...	...	...	961	....
3.	...	...	...	...	....	1,232
4.	...	2	1	...	61	589
5.	...	...	...	...	244	....
6.	3	...	...	...	347	226
7.	...	...	...	...	1,704	319
8.	...	...	...	...	....	....
9.	...	...	...	...	563	3,446
10.	...	...	...	...	....	4,165
11.	...	...	...	...	2,519	195
12.	52	13	...	...	1,233	584
13.	...	...	...	...	1,389	26
14.	12	*a*33	...	...	5,414	4,794
15.	...	...	6	...	76	3,336
16.	12	41	3	...	5,557	817
17.	6	...	3	...	2,294	1,141
18.	...	...	...	...	1,186	615
19.	...	...	...	...	....	....
20.	...	...	...	...	132	....
21.	...	...	...	...	18,503	1,810
22.	...	3	11	...	3,084	1,013
23.	...	...	...	...	....	64
24.	175	...	399	...	23,967	3,247
25.	...	...	...	...	13,351	18,810
	260	92	433	...	83,654	46,433

a. Special exercises for. *b.* 6,000 inspections for.

B. COMMON AILMENTS.

	Boils, ess. AbscEtc. M.D.	Boils, ess. AbscEtc. Nurse.	Acute Sore Throat M.D.	Acute Sore Throat Nurse.	Bronchitis. M.D.	Bronchitis. Nurse.	Cleanliness Needed. M.D.	Cleanliness Needed. Nurse.	Catarrh Rhinitis. M.D.	Catarrh Rhinitis. Nurse.
	128	129	130	131	132	133	134	135	136	137
1.	2	...	...	...	...	...	21	...	7	...
2.	...	...	21	...	...	...	...	...	...	...
3.	...	5	...	15	...	...	...	21	...	...
4.	8	...	...	74	...	...	...	8	14	...
5.	...	...	...	...	...	...	...	...	...	...
6.	1	4	90	51	...	...	29	19	1	...
7.	...	...	...	...	...	...	...	...	1	...
8.	...	...	...	...	...	...	E1	...	...	...
9.	...	...	...	...	...	...	...	...	...	...
10.	...	...	...	...	...	...	...	...	...	...
11.	2	...	16	...	1	3	...	2	1	...
12.	...	...	2	...	...	...	8	8	2	...
13.	...	...	24	...	3	...	1	...	1	...
14.	...	8	...	...	...	...	37	...	34	...
15.	2	...	2	...	3	...	20	...	12	...
16.	13	...	...	...	14	...	6	...	220	...
17.	10	...	...	...	...	2	11	4	28	...
18.	...	...	...	...	20	...	...	...	...	...
19.	...	...	...	...	...	...	...	...	...	...
20.	...	...	...	...	...	...	...	...	...	...
21.	...	...	...	...	...	...	...	...	...	...
22.	17	12	75	3	7	...	*b*	98	4	...
23.	...	...	...	...	...	...	81	...	...	...
24.	16	...	...	...	...	...	41	40	...	...
25.	314	...	...	13	270	139	...	...	327	251
	385	29	230	156	318	148	256	200	652	251

B. COMMON AILMENTS.—*Continued.*

	Colds "Bad," Coryza.		Ear Discharge, Otitis Media.		Ears: Cerumen. Ache, Foreign Bodies.		Eczema.		Eyes: "Sore," Blepharitis, Styes, Iritis, Cor. Ulcer, Keratitis.		Headache (a symptom) Neuralgia, Migraine.		Laryngitis, Chronic Sore Throat.		Nose-bleed Epistaxis.		Pharyngitis.	
	M.D. 138	Nurse. 139	M.D. 140	Nurse. 141	M.D. 142	Nurse. 143	M.D. 144	Nurse. 145	M.D. 146	Nurse. 147	M.D. 148	Nurse. 149	M.D. 150	Nurse. 151	M.D. 152	Nurse. 153	M.D. 154	Nurse 155
1.	...	...	6	...	...	...	9	...	24	...	...	...	1	...	...	...	...	...
2.	...	...	...	...	...	...	...	...	11	...	...	...	...	...	...	...	...	...
3.	...	50	...	7	...	...	...	9	..	2	...	...	...	...	...	...	...	...
4.	...	33	4	27	2	...	2	...	9	16	6	36	21	...	...	2	...	...
5.	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
6.	...	108	9	10	...	...	48	17	20	26	29	44	...	10	4	1	12	...
7.	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
8.	...	...	E1	...	...	...	...	...	E4	4	...	...	...	...	...	...	...	...
9.	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...	...	...
10.	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
11.	...	...	...	...	...	...	1	2	53	14	9	...	...	...	...	...	...	...
12.	...	...	...	22	...	...	3	3	..	...	...	...	...	...	...	...	...	...
13.	...	...	24	...	...	...	41	...	7	50	1	...	...	...	...	...	...	...
14.	...	...	105	T16	77	67	5	T97	234	110	...	5	1	...	...	...	...	...
15.	...	...	38	104	...	...	31	11	..	...	5	...	1	...	...	...	...	...
16.	...	...	7	...	...	...	30	...	34	...	...	...	...	...	...	...	24	...
17.	...	...	12	69	65	...	35	6	15	54	8	...	15	...	...	...	...	...
18.	...	...	...	12	35	...	15	...	186	...	...	...	...	...	...	...	...	...
19.	...	...	...	...	...	...	...	...	..	157	...	...	...	...	...	...	...	...
20.	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
21.	...	...	...	...	...	...	...	...	47	...	...	...	...	...	...	...	...	...
22.	...	...	132	...	12	...	135	...	140	203	23	...	24	3	3	...	...	3
23.	...	...	E3	...	...	...	...	E110	E27	...	E5	...	...	...	...	...	...	...
24.	...	...	31	...	...	...	...	T9,857	161	...	206	...	...	...	...	...	...	...
25.	375	109	354	411	29	229	996	433	862	1,116	296	...	160	144	96	136	774	111
	375	300	726	678	250	296	1,351	10,545	1,843	1,752	603	85	223	157	103	139	810	114

E. Excluded. T. Treated or treatments.

B. COMMON AILMENTS.—*Continued.*

	Rheumatism.		Sex Ailments, and Habits.		Skin: Herpes, Seborrhea, Acne, Etc.		Stomatitis, Mouth Ulcers.		Wounds, Sores, Sprains, Poison Ivy, Chilblains, Etc.		Urinary, Renal, Eneuresis.		Totals for Common Ailments.	
	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.	M.D.	Nurse.
	156	157	158	159	160	161	162	163	164	165	166	167	168	169
1.	...	...	...	...	7	....	...	...	2	....	...	...	79	....
2.	...	...	...	...	11	....	...	...	3	....	...	...	47	....
3.	...	...	...	...	....	61	...	...	....	346	...	2	....	518
4.	...	...	...	...	....	....	1	...	20	1,169	2	3	89	1,368
5.	...	...	...	...	1	....	...	...	E1	....	...	...	2	....
6.	6	7	3	...	27	19	...	...	187	69	13	2	479	387
7.	...	...	...	...	....	....	...	...	....	....	...	...	1	....
8.	...	...	...	...	E20	....	...	...	....	....	...	...	26	4
9.	...	...	...	...	49	28	...	...	....	134	...	...	58	162
10.	...	...	...	...	....	....	...	...	....	....	...	...	....	....
11.	...	...	...	...	8	....	1	...	5	8	...	...	97	29
12.	...	...	...	...	45	68	...	...	1	23	...	1	61	125
13.	...	...	...	...	....	41	...	...	20	....	1	...	123	91
14.	...	...	...	...	1	6	...	...	3	....	...	8	497	317
15.	...	...	...	...	41	....	...	...	39	....	...	...	193	115
16.	2	...	...	...	50	....	...	...	9	....	3	...	412	....
17.	...	...	...	9	49	....	2	...	41	3	7	39	290	186
18.	...	...	...	...	....	....	...	...	22	....	...	...	278	12
19.	...	...	...	...	....	644	...	...	....	328	...	...	....	1,129
20.	...	...	...	...	E28	....	...	...	....	....	...	...	28	....
21.	...	...	...	...	174	282	...	...	....	....	...	...	221	282
22.	...	...	9	...	246	....	3	...	506	106	20	13	1,356	451
23.	...	...	...	...	....	....	...	...	....	371	...	...	116	481
24.	...	...	...	...	422	....	...	...	....	5,488	...	...	877	15,385
25.	32	...	91	...	1,824	865	105	120	2,023	9,089	33	152	8,961	13,318
	40	7	103	9	3,003	2,014	112	120	2,882	17,134	79	220	14,291	34,360

E. Excluded.

4. CLEANLINESS NEEDED

The great enemy of health is filth, and, along with fresh air, exercise, and nourishing food, cleanliness constitutes one of the great preventive methods. Dr. Cruickshank, in his 1911-12 Dunfermline report previously mentioned, adequately sums up the matter (page 109) in these words:

"On looking through the report one cannot help being impressed by the number of children suffering from diseases which ought to be—which indeed *are* preventable. And when we analyze the causes of the various diseases and defects and seek some common factor operating in every case we find it in the environment. But environment itself is so complex that we must seek for some common factors in it which specially influence the health of tender child life. *Of these factors there are several, but the most important are dirt and foul air. Lack of cleanliness, personal and otherwise, and absence of fresh air, are probably accountable for more diseases than all other factors together.* Frequently they are the direct cause, as in certain inflammations of the eyes and skin, frequently the indirect cause, as in many cases of malnutrition and tuberculosis."

The schools must fight filth as the arch-fiend.

The details regarding school baths, compulsory and enticed cleaning, and the like will be set forth later.

Some of the cities do not mention this condition or ailment; Boston mentions it in neither the health nor the school department reports. None of the cities are equipped at the schools for providing adequate school cleaning, and it is a waste of energy to tell a child to bathe at home when there is no bathtub there and his parents have never practiced this element of civilization, frequent bathing. Shower baths and swimming pools are essential to the cleanliness of the child population. Rigid treatment will in most cases procure for the children clean underclothing and other garments, and the teacher can look out for faces and hands. Some persons advocate hot and cold water wall-washbowls in each class room not only for the purpose of affording drinking water by means of a sanitary drinking fountain and water for drawing work and cleaning the blackboards and watering flowers, but also to help develop the personal cleanliness habit.

Great tact and care is, of course, required of the school nurse and teachers, but the matter can hardly be overemphasized from the health standpoint.

Some of the frequencies for uncleanliness are as follows: Summit, 2 per cent; Norwood, 1.3 per cent; Winchester, .5 per cent; Montclair (estimate, 35 cases), 1 per cent; Yonkers, .3 per cent; New Bedford, .2 per cent; Providence, .3 per cent; Jersey City, .2 per cent; Newark (45 cases), .2 per cent. This is an average percentage of .6.

Considering the fact that many cases are not recorded, and that in some of these cities, such as Providence, the inspection covered only a part of, or very inadequately, the elementary school population, and that these figures where there were no examinations are based upon enrollment and not average attendance, we should probably find that at any one time *from one to two per cent* (*say one*) *were in need of immediate cleaning* (bathing and clean clothes, not to mention vermin) in order to make them sanitarily wholesome members of a classroom. The physician in Summit, in a first-class suburban city, found a higher percentage of cases, I believe, because he was more sensitive to this condition, took a more energetic attitude toward the treatment of such cases, or kept better records of the work done. The physician who is director of hygiene at Cambridge has devised a nozzle for a hose by which he washes down ten to fifteen boys at a time to their and their teachers' delight.

We give below the summaries of two of the four tables on Cleanliness given in the 1911-12 report of Dunfermline, Scotland:

Number of children examined, ages 4 to 14 and over, 999 boys and 828 girls.

	Per cent. Boys.	Per cent. Girls.
Cleanliness, "Good. Above average percentage."	58.15	69.41
Cleanliness, "Medium. Average percentage."	37.73	29.35
Cleanliness, "Bad. Below average percentage."	4.10	1.23

The girls are cleaner than the boys, although, as shown in other tables, with their long hair they suffer more from pediculosis which may also be looked upon as uncleanliness.

Other tables show that boys are very much dirtier at the age of eleven, than at any age before, while girls grow cleaner.

Percentage of children marked *"bad" as to cleanliness* in Dunfermline, Scotland, 1911-12. Children examined, 999.

	Per cent. Boys.	Per cent. Girls.
Infants examined for first time, average age, 6 years	1.62	1.22
Examined entering Senior School, average age, 8 years	3.1	1.23
Third examination, 11 years	5.55	1.01
Fourth examination, leaving school, 14 years	1.51	....

The director of hygiene points out the fact, too, that parents, on receiving the notice of, and the invitation to the examination of their children get them in clean condition for it. "Parents receive notice of the intending examination, and frequently prepare the children for it. The figures returned from the School Medical Officer's examination will therefore always show a condition of things better than actually exists" (page 30).

If physicians and nurses in this country tabulated their findings and made as careful studies of their children as these figures indicate it is very probable that our larger estimate of *two per cent* of all elementary school children would not be too large.

5. CATARRH, CHRONIC RHINITIS, COLUMNS 103-4

Chronic bad cold and "running nose," resulting from sitting in school with wet feet, bad ventilation at school or home, or some other single or combination of causes, is a more serious and common ailment than is generally realized. Most of the cities that have much to report at all regarding the health conditions of the children in general, and not merely from one particular aspect, say infection, report some cases. The number of cases found will depend upon the time of year the examination or the inspections take place since many cases may remain undetected until bad weather or other untoward conditions bring them out.

The Dunfermline report previously mentioned has this to say regarding catarrhal conditions in connection with adenoids: "Adenoids are clearly associated with catarrhal conditions of the naso-pharnyx. As these conditions are so very prevalent we must continue to expect large numbers of children to suffer from this disagreeable and harmful condition. It is quite probable, however, that pure air in the schools, instruction in the use of the handkerchief, and, when adenoids are suspected, the daily practice of nasal respiratory exercises, would reduce the frequency of operation for this condition to a minimum" (page 35).

Some of the frequencies are as follows: Trenton, 2 per cent; Summit, 7 per cent; Hoboken, only 3 cases recorded; Rochester, with over 15,000 pupils examined, records no case; Yonkers, 1 per cent; Cambridge, 2 per cent; Newark records no cases and no other ailment which seems to cover this condition unless it could be placed with adenoids, which is unlikely; Boston (327 cases), .5 per cent. Here we have an average for the cities mentioning the most cases an average percentage of .7. The frequency must be almost that of cleanliness, one or two per cent, say *one* per cent. How many cases the various cities missed, judging that the actual variations as among cities is not great, can be seen by comparing the figures given, reduced to percentages, with this standard. Boards of Health, as with most other diseases, have a bad showing.

6. BAD COLDS, CORYZA, COLUMNS 105-106

In this list are those severe, comparatively non-infectious colds which are so frequent among children and which entail such severe consequences. Probably all colds are more or less infectious. Hoag, in his "Health Index of Children," page 50, says they are the most infectious of all ailments: "Colds are probably about the most contagious form of disease we have, yet many, if not most people still go on regarding them as due to drafts, getting wet, to 'night air' and similar delusions. As a matter of fact anything which is capable of reducing our *resistance* makes it easy for cold germs to gain the ascendancy, but the cold is directly due to the *germ or germs,* and these causes should not be confused with the predisposing factors."

Since "a cold can always be laid to someone else," as seems probable, it should, perhaps, be treated as an infectious disease of the minor group, instead of in this place. We give place here for it, because no city of which I know places it in the infectious group. I leave place for it also, however, along with influenza and grippe. The future will probably bring about a handling of "bad colds" the same as other infectious ailments.

Nurses mention this ailment in but four cities and the physicians in but one. Both the health and the school departments record it as Coryza in Boston. The frequencies are as follows: Norwood (50 cases), 3.2 per cent; Winchester (33 cases), 2.2 per cent; Montclair (108 cases), 3.3 per cent; Boston (400 cases), .7 per cent.

The average percentage of elementary children is, *therefore, 2.7 per cent.* Undoubtedly, the ailment occurred with the same or greater frequency in all cities but was not recorded. The inadequate medical staffs found that they had far more than they could do with the most serious and even death-dealing diseases, to pay any attention to these minor ones which so frequently bring on the greater. If we are going to make medical supervision what it should be, a means of scientific *prevention* as well as cure, however, these cases of coryza or bad cold will receive attention and study.

Our estimate of this ailment, counting only cases which should probably be out of school, or at least receiving careful treatment, is *at the lowest, three per cent.* It is probably not less frequent in high school. Rather infrequent inspection at the Montclair high school seems to show this.

These are regarded as separate and distinct cases, although we have here an ailment which may come upon a child more than once in a school year. Perhaps, too, not less than three per cent of the school children are affected with bad colds at some time in the year. Those experienced in the classroom would probably place the estimate very much higher.

7. EAR DISCHARGE, OTITIS MEDIA, RUNNING EAR, OTORRHEA, COLUMNS 107-108

Here we have a serious ailment closely connected with deafness and adenoids. Starting from bad colds and nasal catarrh, along with adenoids and perhaps enlarged tonsils, we get an inflammation which travels up the eustachian tubes and sets up a suppuration in the middle ear which, breaking through the ear drum, pours out along the channel of the outer ear, a most distressing condition. If not cared for the ailment may spread into the mastoid bone back of the ear, making necessary operations for mastoiditis.

The treatment takes a long time, generally, and nothing short of a first-class school clinic will meet the situation for most children. Sixty-seven cases made 3,074 visits to the school clinic in Dunfermline, Scotland, an average of about 46 visits each, and probably not all of these cases were cured at the time of reporting.

A medical inspection system which neglects this ailment is either derelict in its duty, or very far short of what the school medical service should be.

Seven cities in this group of twenty-five have made no record of such cases, either by nurses or physicians. Jersey City records but 3 cases, excluded. About how many cases there actually were can be estimated from the following percentages:

Frequency of Ear Discharge among elementary pupils: Summit, .6 per cent; Norwood, .2 per cent; Winchester, 1.8 per cent (27 cases); Montclair, .3 per cent; Schenectady, 2.2 per cent; Waterbury, .2 per cent; Yonkers, .8 per cent; New Bedford (110 cases), .9 per cent; Trenton (among 10,587 pupils examined only 7 cases); Cambridge (69 cases), .4 per cent; Providence, .4 per cent; Newark (24,310 children examined, only 31 cases), .1 per cent; Boston (425 cases, counting new cases found by nurses), .7 per cent. Average percentage, .7 per cent.

Among 1,812 children ranging in age from four to above 14, in Dunfermline, there were 37 cases of "purulent discharge," and 15 cases of "old discharge," percentages of 2 and .8. This *percentage of* 2 seems to be about the number we should find here if we were to have more careful examinations of all children. This will vary with the cities somewhat, undoubtedly, but, I feel sure, much more because of the differences in the doctors and nurses. Many of the cases, moreover, have no actual discharge at all, and yet are serious enough to cause partial deafness.

The 1910 report of the Board of Education of England on this subject (page 48) gives the following summary of a table showing the relation of ear discharge to defective hearing and adenoids and tonsils:

Number children with defective hearing, all ages	441
Proportion of these cases due to:	
Middle ear disease with discharge	14.0%
Middle ear disease without discharge generally associated with enlarged tonsils and adenoids	65.7%
Ceruminous obstruction (ear wax)	20.1%
	99.8%

According to this report, we should judge that about 80 per cent of deafness comes from this ailment. We found that the probable proportion of defective hearing was about one per cent. This would show that middle ear disease was more frequent than one per cent. We do not have recorded here the number of cases with no associated defective hearing.

In the 1911 report of the same health officer (Sir Geo. Newman, London) we have another summary of several tables, page 44, which throws more light on this ailment. It is a report of the causes of deafness found among 1,265 children aged five, and 1,352 aged 12 examined, 2,617 altogether:

CAUSES OF DEAFNESS. 2617 PUPILS

	Per cent. Age 5.	Per cent. Age 12.
Due to adenoids	78.4	52.0
Due to suppurative otitis media (ear discharge)	15.6	38.0
Due to suppurative otitis media and adenoids	5.8	10.0
	99.8	100

This shows a slightly different emphasis, showing perhaps that back of it all are the adenoids. Since adenoids are probably enlarged through neglected colds almost entirely, we see here a serious chain of factors which must not be overlooked by the school medical service.

In summary, we should say that this is a very serious ailment, somewhat difficult of diagnosis, very hard to cure, and taking a long time, and existent among from one to two, *say* 1.5 *per cent* of elementary school children, more in the the lower grades than in the higher. This is practically Cornell's estimate given in his book, page 589.

8. EARS, MINOR AILMENTS, IMPACTED CERUMEN OR EAR WAX, EAR ACHES DUE TO SEVERAL CAUSES, BUT FREQUENTLY TREATED BY THE NURSES, FOREIGN BODIES IN THE EAR, ETC.

We have maneuvered our nomenclature to bring otitis media and the other ear ailments together. These other ailments are minor but important. We have seen the influence impacted ear wax has on hearing, producing over 20 per cent of the cases according to the investigator quoted, and the persistent earache, foreign bodies and small boils, and the like are no small part of a child's life, meaning, if nothing worse, absence from school or poor attention in it in many cases. Most of the cases are cases of impacted cerumen, although the Boston nurses reported 222 cases of eczema of the ear to 229 cases of cerumen and 40 of foreign bodies. The eczema and boils frequently come from scratching due to pediculosis and dirt, and consequent infection.

Only six cities mention these smaller ailments of the ears. Winchester mentions only two cases; Yonkers (say 80 cases),

.6 per cent; Cambridge, .4 per cent; Lowell, .3 per cent; Providence, 12 cases only; Boston (229 cases, eczema cases put with eczema), .3 per cent. The average is .4 per cent. These cities did not have physical examinations, so we may understand that only a part of the cases among the entire enrolled elementary school population were found. *Half a per cent (.5 per cent) seems reasonable for these minor ailments.* Careful records of the whole health history of children will probably increase this percentage. We notice as we go along that those cities having the names of these ailments printed on the report forms get records of such cases, while those that have a few names of ailments which are very uncommonly met, e. g., tuberculosis, do not get them. The medical officers do not look for the ailment, or else fail to write it in.

9. ECZEMA

"Eczema is a non-contagious inflammation of the skin caused principally, or altogether, by disturbance in nutrition" (Cornell). There are many varieties, and many skin ailments are called by this name which are not true eczema. The ailment is handled chiefly by the nurses, and cared for by them, either in giving treatments or in showing mothers how to give them. In Newark, only the nurses mention this ailment, but they record 9,857 cases as treated. Whether this represents so many children we cannot say.

Frequencies: Summit, .9 per cent; Norwood, .5 per cent; Montclair (55 cases), 1.4 per cent; Waterbury, .3 per cent; Yonkers, .8 per cent; New Bedford, .2 per cent; Trenton, .3 per cent; Cambridge, .2 per cent; Lowell, .1 per cent; Providence, .4 per cent; Newark, 45 per cent;* Boston (1,000 cases), 1.6 per cent (on 61,000 inspections), 1 per cent on 100,000 inspections.

*A most astounding percentage, and probably meaning cases, with several cases to a child than that not far from half of the children examined had the ailment. The percentage would be also decreased by half when we consider that the nurses covered *all* the elementary school population, in a way, while the examination reached only about half. Leaving this at 15 per cent would be very far beyond other cities.

The average percentage, excluding Newark, is .6 per cent. The actual number of cases does not probably exceed *one* per cent. *Let us say .7 per cent.*

10. EYES, MINOR AILMENTS. SORE EYES, BLEPHARITIS, STYES, IRITIS, CORNEAL ULCER, KERATITIS, FOREIGN BODIES IN THE EYE

Here we have a host of comparatively minor and yet serious cases of eye ailments, mostly of the external eye. Some or most of these can be obviated, perhaps, by proper glasses, thus avoiding eyestrain and lowered resistance. We do not include here conjunctivitis of any kind nor trachoma, since they properly belong in the infectious group, and must receive different treatment. Blepharitis, or common sore eyes, is found more frequently than any other in the group, with styes a close second.

The frequencies are greater than for any ailment found for some time, and the column showing the nurses' cases is well filled, showing that the nurses have handled a good many of them, and probably found many new cases not found by the doctors.

Percentages of elementary school population or of number of children examined: Summit, 2.3 per cent; South Manchester, .7 per cent; Norwood, only two cases; Winchester (16 cases), 1 per cent; West Orange, no cases; Montclair (26 cases), .8 per cent; Hoboken (53 cases), .6 per cent; Waterbury, .4 per cent; Yonkers (234 cases), .2 per cent; Trenton, .3 per cent; Cambridge (54 cases), .4 per cent; Lowell, 1.7 per cent; New Haven, .7 per cent; Rochester, .3 per cent; Providence (203 cases), .7 per cent; Jersey City recorded only excluded cases; Newark, .7 per cent; Boston (1,116 cases), 1.8 per cent.

The average percentage is .8 per cent.

We get our surprises here from the cities that are supposed to have physical examinations, much more careful than inspections, but the examination cities excepting Summit do not show up well in this case. Some of the cities report no cases and these are either board of health cities or other cities starting the work and not yet well established.

We should not expect Summit to have the largest proportion of cases, since its environment is very good and there is but a small foreign (Italian) section. We should expect these ailments in the mill and factory towns such as Hoboken, Jersey City, Lowell, New Bedford, Providence and Newark. The cases were probably there but were not found.

The same conservative judgment hitherto exercised would lead us to estimate these ailments as existing in *at least* 1.5 *per cent of* the elementary children at some time during the school year, and that the percentage of cases would be about *two per cent.*

11. HEADACHE, NEURALGIA AND MIGRAINE

These are symptoms, of course, but they must be treated as ailments by the nurses and often by the physicians because of inability or lack of necessity of giving a thorough diagnosis. The eyes may be tested, the teeth examined, and the nurse can have a talk with the mother about the child's digestion and food, but even then the cause may be untouched.

Strangely, the physicians report the ailment more than do the nurses, the latter in only three cities mentioning it. Some of the frequencies are as follows: Summit, 1.4 per cent; Winchester, 2 per cent; Montclair, 1.3 per cent; comparatively few cases in the following cities:Newark, .8 per cent; Boston, .4 per cent.

The average is about 1.3 per cent.

For various reasons, we judge this proportion to be actually about 1.5 per cent to 2 per cent, *say, at least,* 1.5 *per cent.* Dr. Hoag reports very much higher percentages among the rural schools of Minnesota, but his data are extremely poor, resulting from questioning pupils.

12. LARYNGITIS

Only five cities record over one case of this ailment.

In Winchester, the frequency is 1.4 per cent; in Montclair, .3 per cent; Cambridge, .1 per cent; Providence, .07 per cent; Boston, .25 per cent.

The average for these cities is .4 per cent.

The ailment is so bound up with colds, sore throat and the like, that it is bound to be very variable, perhaps. Nevertheless, both departments at Boston and a number of other cities give it separate record, and this is probably best. We leave it with an estimate of five in a thousand.

13. NOSE-BLEED, EPISTAXIS.

Children frequently have nose-bleed and do not know how to stop it, using various nostrums and superstitious charms instead of effective means for stopping the enervating bleeding.

The nurses in Boston found 136 cases, a percentage of less than .2 per cent. Perhaps the general proportion would stand near this number, .2 per cent.

14. PHARYNGITIS, CHRONIC SORE THROAT, COLUMNS 121-2

We get our principal notice of this ailment, also, by both departments at Boston. Only three other cities mention it, yet it is a fairly common ailment of childhood.

Montclair had 12 cases reported, a percentage of .3 per cent; Trenton, .2 per cent; Boston (175 cases, counting some new ones found by the nurses), .3 per cent, or less.

With little further study, we leave the estimate for future investigations to correct *at .3 per cent*—the ratio of cases found to the elementary school population when all children are carefully inspected and examined.

15. RHEUMATISM AND "GROWING PAINS"

Rheumatism is very serious because of its effect upon the heart, and the so-called "growing pains" should be carefully looked into. The ailment is fortunately not common. Only three cities mention it. The frequencies are also very low. One case in a thousand would probably be above the mark. Closer examinations will probably show, however, that *.1 per cent is not an overestimate* of the actual number of cases among elementary school children.

Every case should be carefully studied with a view to cure and prevention. Heart disease probably arises in most cases from an attack of rheumatism in childhood; and this is one of the greatest death-dealing diseases, standing only lower than tuberculosis. "It is impossible to cure organic heart disease, but the study of its prevention becomes one of the most important functions of the school medical service."—Cruickshank.

16. SEX AILMENTS AND HABITS

Very few ailments of this character are mentioned, largely because of the lack of searching examinations and careful following-up of cases. Some nurses have done splendid work in this field of sex education, cure and prevention. Some of the ailments mentioned are: Montclair, 2 cases of masturbation and one of vaginitis found by a physician; Cambridge, 9 cases of masturbation found by nurses in careful follow-up work; the same number of cases found in Providence of this harmful habit; and 91 cases of syphilis found by the doctors in Boston.

These findings speak well for the purity of our children and the homes, even though we may be sure, as is true, that many cases were not reported for personal reasons and because this has not yet been recognized as a part of the duties of the health officers. When we have careful inspection and examinations and thorough follow-up work we shall discover much needed evidence for emphasizing in some manner sex education of the young.

The syphilis cases were 1.5 per cent of the children inspected in Boston. Only this one ailment is mentioned. In the other cities, the percentages are less than one per cent.

Counting all cases actually present among the children and including the habit mentioned, *certainly not less than* 1 *per cent are affected.*

Cornell (page 554) emphasizes knowledge: "A thorough knowledge of syphilis and gonorrhea . . . should be gained by teacher and high school student. Then there will be some hope of preventing these diseases. The salvation of these weakly, infected children depends largely upon the recognition of the syphilitic cases by the school inspector."*

No prudishness or sentimental false modesty must stand in the way of rooting out such ailments from the lives of the children if possible. According to the old Greeks the wise person is known by his hates and what he fights. Any study of this ailment, brought upon the innocent as portrayed in Ibsen's "Ghosts" and Brieux' "Damaged Goods," will disclose a combatant, one of the most hideous and deadly of civilized life.

17. MINOR SKIN AILMENTS: HERPES, SEBORRHEA, ACNE (BLACKHEADS), SIMPLE RASH, POISON IVY, ETC.

The serious skin ailments are all given separate mention. Here we have those frequent minor, non-infectious ones which furnish the nurses with so much work in the form of treatment and follow-up. Still certain cities do not mention the ailments of this group at all.

The frequencies are as follows: Summit, .7 per cent; S. Manchester, .6 per cent; Norwood, 4 per cent; Montclair (27 cases), .8 per cent; Mt. Vernon, .3 per cent; Newton (49 cases), .8 per cent; Hoboken (8 cases), Schenectady (68 cases), .6 per cent; Waterbury, .3 per cent; New Bedford, .3 per cent; Trenton, .4 per cent; Cambridge, .9 per cent; New Haven, 3 per cent; Rochester (300 cases), 2 per cent; Providence, .8 per cent; Newark, 1.7 per cent; Boston (2,000 cases), 3 per cent.

The average is 1.2 per cent, and the deviation is large as in all cases where certain cities have left out all mention of the ailment.

What the true percentage of new cases is we hesitate to judge; but leave the very tentative estimate *of* 1.5 *per cent.*

18. STOMATITIS, MOUTH ULCERS

Boston is the only city which emphasizes this ailment,

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*Cornell reports also that in institutions for the feeble minded twenty per cent of the inmates are victims of syphilis.

although there are four other mentions of it with only 7 cases.

Counting the number of cases which the nurses saw, 120, we have a very small percentage. The nurses of Boston probably covered the entire elementary school population of nearly 96,000 which would give only a .1 percentage.

We leave the *probable true number of cases at this figure, .1 per cent.*

This ailment might be recorded with minor skin ailments, or with malnutrition, but it will probably be best to give it separate mention. McCombs, in his "Diseases of Children for Nurses," page 99, says: "This disease is very common among the poorer class of patients. It is due to uncleanliness and to a spongy condition of the mouth seen in ill-nourished children. There are several varieties named according to the appearance of the lesions in the mouth."

In most cities the doctors and nurses evidently miss this ailment.

19. WOUNDS, SORES, SPRAINS, CHILBLAINS, POISON IVY, "FIRST AID," DRESSINGS

Here we have a very common group of ailments where the nurses can be of great assistance. Children are always getting cut, bruised, hurt, and the like. Nose-bleed might also go in this group. The nurse shows the child how to apply principles of cleanliness and simple medicine and so not only saves pain and possible infections or worse, but educates the children in a very practical manner.

It can be seen that some doctors and nurses consider these ailments within their province and some do not. Some also may consider them too trifling to report. However, if they take up time, and are worth doing, they are worth reporting; and this is the more general custom.

Eleven cities either give no mention or report exceedingly few cases. Eight are board of education cities and three are board of health.

The larger percentages are as follows: Norwood, 22 per cent; Winchester, 77 per cent; Montclair (187 cases), 5 per cent; Newton, 2 per cent; Hoboken (8 cases); Yonkers (3 cases); New Bedford, .3 per cent; New Haven, 1.5 per cent; Providence, 1.6 per cent; Newark, 14 per cent; Boston, 10 per cent.

These variations are extreme. Large perceentages mean both a number of treatments of the same case, and real solicitude and care of the children, most probably.

The average for the percentages given is 15 *per cent.*

This number, taking all facts into consideration, may probably represent fairly accurately the actual number of new cases among the elementary school population in any one year which need the attention of the nurses, and which may come also to the attention of physicians.

20. URINARY AILMENTS, ENEURESIS, RENAL TROUBLE, FREQUENT REQUESTS TO LEAVE THE ROOM, INCONTINENCE OF URINE

This weakness of children is quite common but does not receive very frequent mention. Some selected percentages of cities that seem to have had their attention drawn to this ailment are: Montclair, .4 per cent; Cambridge, .2 per cent; Providence, .06 per cent; Boston, .1 per cent.

For an estimate of little value, we place the *average at* .2 *per cent* as the actual number of such cases.

CHAPTER EIGHT

COMMUNICABLE AILMENTS, PARASITIC AND INFECTIOUS

II. COMMUNICABLE, OR TRANSMISSABLE AILMENTS

Here we enter the second grand division of ailments which are of a very serious character because they can rapidly be passed from child to child. Serious doubt is thrown over the old theory, that such diseases as Scarlet Fever and Diphtheria are propagated and diffused principally at the schools, by Dr. Chas. V. Chapin, Superintendent of Health of the city of Providence, Rhode Island (Annual Report for 1911 and former reports). His data, reaching back to 1885, also throw reasonable doubt over the theory that disinfection and certain forms of exclusion are necessary in the case of such ailments. We very much need rigid tests of all these old suppositions by scientific procedure, and the whole subject bristles with unsolved or untouched problems. The number of deaths caused by the more serious of these ailments is given elsewhere, both for the country, page —, and for the cities, table —, columns —.*

The living organisms causing these ailments are mostly animals, but some are plants, ringworm and favus being due to fungi. The animals vary in size from the large and very common louse down to the itch-mite, almost too small for the naked eye, and thence rapidly down to the microscopic and almost undiscoverable germs, or bacilli, so well described zoologically in such books as Hough and Sedgwick, "The Human Mechanism," and even Ritchie's "Primer of Sanitation."

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*See also the 1912 N. E. A. Proceedings, article by Professor Jordan, of the University of Chicago.

A. Parasitic and Minor Infectious Ailments

For a long time the writer kept only the parasitic ailments in this class. They are ailments which it is the special duty of the nurses to drive out of existence as nearly as possible. But conjunctivitis, impetigo, grippe, and tonsilitis all seemed later to belong to this class more than to the serious infectious diseases which may be death-dealing. The advantages of such a classification need not here detain us. Its value will come out by use, and will stand or fall on how well it serves its purpose.

1. CONJUNCTIVITIS, PINK EYE. COLUMNS 137-8

The various forms of conjunctivitis are not differentiated here. They are very infrequently separated in the reports. The pupil's record card may well contain the specific name, but for general reporting the single term is probably best until the need arises for more detailed reporting. The most common form is, perhaps, the "pink eye" which frequently plays such havoc with attendance in the primary grades.

In the case of conjunctivitis, as with most infectious ailments, some cities report only the *excluded* cases. For the *serious* ailments this will be equivalent to the entire number of suspected or actual cases, but this is not true for several of the minor ailments. The parasitic ailment cases may all remain in school with proper precautions.

Some of the frequencies for conjunctivitis are as follows:—The first three cities, only three cases reported; Winchester (15 cases excluded), 1 per cent; West Orange, 3 per cent; Montclair, 3 per cent; only 9 cases in the next four cities; Hoboken, .8 per cent; Schenectady, 2.3 per cent; Waterbury, .8 per cent; Yonkers, .4 per cent; N. Bedford, .4 per cent; Trenton, 1 per cent; Cambridge, .5 per cent; Syracuse, .9 per cent; Providence, .4 per cent; Newark, 1.6 per cent; Boston (1,526 cases), 2 per cent.

The average is 1.3 per cent. Seemingly, the more careful and thorough the inspection or examination, the closer the percentage comes to two per cent, or more.

II. COMMUNICABLE AILMENTS: A. PARASITIC AND MINOR INFECTIOUS AILMENTS.*

	Conjunctivitis, Pink Eye. M.D.	Conjunctivitis, Pink Eye. Nurse.	Favus, Yellow Scalp Sores. M.D.	Favus, Yellow Scalp Sores. Nurse.	Impetigo Contagioso. M.D.	Impetigo Contagioso. Nurse.	Influenza, Grippe. Infect. Colds. M.D.	Influenza, Grippe. Infect. Colds. Nurse.	Pediculosis, Lice, Vermin. M.D.	Pediculosis, Lice, Vermin. Nurse.	Ringworm, Skin, or Scalp. M.D.	Ringworm, Skin, or Scalp. Nurse.	Scabies, Itch. M.D.	Scabies, Itch. Nurse.	Tonsilitis, Quinsy, Sore Throat. M.D.	Tonsilitis, Quinsy, Sore Throat. Nurse.
	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185
1.	1	....	...	...	5	....	...	...	122	....	...	....	....	....	2	...
2.	....	....	...	...	....	....	...	...	66	....	3	....	....	....	....	...
3.	....	2	...	...	....	23	...	...	....	E377	...	1	....	8	....	1
4.	5	E15	...	...	3	E61	1	1	2	E146	1	E3	10	E12	5	...
5.	E46	....	...	...	E10	....	...	...	E57	....	E3	....	....	....	43	...
6.	92	39	3	...	60	59	...	23	340	64	27	23	3	12	8	14
7.	E9	....	E2	...	E22	....	...	...	E298	....	7	....	E4	....	....	...
8.	....	....	E1	...	E32	....	...	...	E450	....	...	....	E11	....	E1	...
9.	....	....	...	...	....	32	7	...	25	338	...	....	....	....	17	...
10.	....	....	...	...	....	....	...	...	....	1,207	...	....	....	....	....	...
11.	71	10	7	2	32	16	...	...	330	116	36	8	2	15	62	2
12.	163	231	...	5	21	16	...	...	185	1,721	1	1	22	6	....	...
13.	E22	....	4	...	224	....	E9	...	4,495	1,410	E6	....	E15	....	....	...
14.	55	4	...	45	3	75	...	...	162	T414	5	14	....	18	18	2
15.	58	....	...	...	195	....	...	...	36	1,189	174	....	132	....	72	...
16.	128	....	2	...	9	....	1	...	69	20	6	....	10	....	19	...
17.	79	42	1	3	39	23	...	...	299	112	33	....	24	30	71	13
18.	23	....	...	...	88	....	...	...	....	465	...	....	8	....	6	...
19.	....	....	...	...	....	....	...	...	E1,050	3,200	...	....	....	....	....	...
20.	167	....	...	...	E51	....	...	...	E752	E1,297	...	....	E60	....	....	...
21.	....	....	...	...	....	....	...	...	E350	....	E3	....	E33	....	E22	...
22.	135	....	...	...	48	66	3	...	308	3,304	60	E6	75	E188	24	...
23.	....	134	E2	5	E108	1,174	...	...	E222	2,671	E38	667	E13	66	E20	...
24.	402	2,637	28	T209	238	T7,389	6	...	925	6,212	162	E3,209	115	E199	337	...
25.	1,528	975	...	...	1,587	1,494	120	41	4,625	11,129	369	504	653	648	1,173	894
	2,984	4,089	50	264	2,775	10,328	147	65	15,167	35,392	934	4,436	1,196	1,172	1,900	926

E. Excluded. T. Treated or treatments. *Totals for Parasitic and Minor Infectious Ailments on next page, columns 186 and 187.

B. INFECTIOUS DISEASES.

	Totals for Parasitic and Minor Infectious Ailments. M.D.	Nurse.	Chicken Pox, Varicella. M.D.	Nurse.	Diphtheria. M.D.	Nurse.	Measles. M.D.	Nurse.	Mumps. M.D.	Nurse.	Scarlet Fever. M.D.	Nurse.	Trachoma, "Granulated Eyelids." M.D.	Nurse.	Tuberculosis of Lungs "Consumption" M.D.	Nurse.
	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201
1.	130	....	...	...	...	...	....	...	...	....	...	...	2	...	...	...
2.	69	....	...	...	65	...	....	...	...	....	75	...	...	...	...	...
3.	....	412	...	8	...	1	....	8	...	....	...	...	...	2	...	1
4.	27	233	4	20	...	...	....	...	...	....	...	16	...	...	...	T2
5.	159	....	E10	...	...	...	E6	...	5	....	E5	...	...	...	...	...
6.	533	234	9	31	1	1	5	15	8	22	E13	5	...	...	1	...
7.	342	....	E9	...	E2	...	231	15	E14	....	E6	...	E2	...	...	...
8.	495	....	E1	...	...	...	....	...	...	....	...	...	E9	...	...	...
9.	49	370	24	...	4	...	39	...	3	....	4	...	...	...	...	...
10.	....	1,207	...	...	...	...	....	...	...	....	...	...	...	...	...	...
11.	540	169	29	...	1	...	41	10	8	1	13	1	4	10	4	...
12.	392	1,980	2	5	...	...	22	8	1	1	...	...	...	...	2	1
13.	4,775	1,410	3	...	...	...	2	...	3	....	...	...	...	...	4	T7
14.	243	572	...	11	...	...	....	...	...	....	...	...	69	T67	19	...
15.	667	1,189	5	...	...	...	5	...	14	....	7	...	19	...	18	...
16.	244	20	1	...	...	...	2	...	3	....	1	...	...	...	3	...
17.	546	223	23	...	2	...	4	...	...	....	2	...	...	17	3	4
18.	125	465	...	...	2	...	....	...	...	....	...	...	...	...	10	T2
19.	1,050	3,200	...	...	164	...	88	...	...	....	497	...	...	...	...	...
20.	1,030	1,297	E33	...	E3	3	E158	E123	E2	....	E43	39	...	...	...	...
21.	408	....	*a*7	...	E1	...	E1	...	E18	....	E5	...	...	...	...	...
22.	653	3,564	11	4	2	4	E13	35	15	20	5	6	4	...	4	T60
23.	403	4,717	E20	...	E38	...	E106	...	E23	....	E74	...	E23	...	E2	...
24.	2,213	19,855	217	...	28	...	167	...	135	....	27	...	T100	...	99	...
25.	10,055	15,685	338	437	23	752	222	...	419	1,344	55	609	49	8	51	166
	25,148	56,802	745	516	336	761	1,112	214	671	1,388	832	676	281	104	233	245

a. Suspected cases. E. Excluded. T. Treated or treatments.

B. INFECTIOUS DISEASES.—*Continued.*

	Tuberculosis of Bones, Joints, Etc. M.D.	Tuberculosis of Bones, Joints, Etc. Nurse.	Whooping Cough, Pertussis. M.D.	Whooping Cough, Pertussis. Nurse.	Totals for Infectious Diseases. M.D.	Totals for Infectious Diseases. Nurse.	Miscellaneous Ailments. Unclassified. M.D.	Miscellaneous Ailments. Unclassified. Nurse.	Toal Number of All Ailments Reported. M.D.	Toal Number of All Ailments Reported. Nurse.	No. of Exclusions.	No. of chil. vaccinated for Small Pox.	Deaths of Children, in these Cities 1910, at School Ages 5-9.	Deaths of Children 10-14.	Deaths of Children 15-19.	Deaths of Children Totals. 5-19.	Total number of all deaths all ages
	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218
1.	..	..	...	...	2	....	45	....	1,325	4	26	255	....	....	....	....	....
2.	..	..	...	...	140	....	....	....	1,217	....	339	....	4	5	2	11	161
3.	..	..	...	...	....	20	....	15	..	2,197	286	....	1	....	1	2	94
4.	..	..	3	E10	7	48	5	10	189	2,248	323	....	....	....	....	....	....
5.	..	..	E4	...	26	....	....	....	431	....	191	....	....	1	3	4	95
6.	..	..	20	24	57	98	10	15	1,426	960	287	....	8	6	11	25	324
7.	..	..	E23	...	287	15	....	....	2,334	334	650	....	10	3	13	26	456
8.	..	..	E3	...	13	....	....	....	534	4	560	....	10	8	7	25	433
9.	..	..	...	...	74	....	23	....	767	3,978	....	50	5	4	7	16	484
10.	..	..	...	...	....	....	....	151	....	5,523	989	....	22	12	17	51	707
11.	..	..	20	3	120	25	79	....	3,355	418	383	....	34	17	31	82	1,328
12.	..	..	...	...	27	15	....	12	1,713	2,716	474	20	23	12	17	52	1,070
13.	..	..	5	...	17	7	20	....	6,324	1,534	222	....	23	23	36	82	1,140
14.	..	1	...	5	88	84	....	307	6,242	6,074	....	188	21	13	22	56	1,226
15.	..	..	2	...	70	....	5	....	1,011	4,640	435	....	45	14	41	100	1,814
16.	18	..	2	...	30	....	3	....	6,246	837	16	....	28	30	46	104	1,976
17.	27	..	...	...	61	21	50	15	3,241	1,586	....	45	25	31	30	86	1,576
18.	..	..	...	...	12	2	....	....	1,601	1,094	319	....	46	19	39	104	2,101
19.	..	..	...	...	749	....	596	644	2,395	4,973	1,480	758	46	28	41	115	2,219
20.	..	..	E2	...	241	165	358	287	1,789	1,749	1,591	800	45	31	51	127	2,123
21.	..	..	E4	...	36	....	E451	....	19,619	2,092	....	2,601	58	38	72	168	3,215
22.	3	..	5	33	62	162	74	9	5,229	5,199	....	....	74	50	94	218	3,980
23.	..	..	E24	...	310	....	....	....	829	9,582	1,353	....	95	77	87	259	4,401
24.	..	..	83	...	856	....	505	3,922	28,412	42,409	4,161	4,221	146	78	130	354	5,784
25.	..	..	126	292	1,283	3,608	1,655	*a*28,046	35,305	79,467	*b*15,087	1,819	246	162	220	628	11,562
	48	1	326	367	4,568	4,270	3,879	33,433	131,540	175,298	29,172	12,757	1,015	662	1,018	2,695	48,269

a. 26,391 by Board of Education nurses, 1,655 by Board of Health. *b.* 6,070 by Board of Health, 9,017 by Board of Education nurses.
E. Excluded. T. Treated.

We leave the estimate that nearly *three* per cent of the elementary school children are probably affected with conjunctivitis in any one school year.

2. FAVUS, YELLOW SCALP SORES, FUNGUS PARASITE

This ailment, while relatively infrequent fortunately, is yet very stubborn in resisting cure. Fortunately, also, it is not very infectious.

One of the best illustrations of the tremendous resistance it offers to curative agents appears in the Dunfermline, Scotland, report for 1911-12, previously mentioned. Three cases attended the school clinic for treatment during the year 283 times, an average of 94 visits each, and even after these we have no statement of cure.

Some of the other averages for visits given in this report for the ailments in this group may perhaps as well be stated here:

	Cases.	No. of Attendances.	Aver. No. of Visits.
Conjunctivitis	46	455	10
Phyctenular conjunctivitis	15	320	21
Ringworm of scalp	26	337	13
Ringworm of body	7	53	7
Impetigo	223	1,127	5
Scabies, itch	22	150	7
Favus	3	283	94

The average number of visits of 2,058 cases treated at this school clinic (14,493 visits) was *seven* visits.

The English Board of Education reports also point to favus as being the most difficult in point of time of all these ailments to cure. It can be seen that a nurse could treat such an ailment almost every day of the school year, perhaps, before effecting a cure.

Favus is rather uncommon and the frequencies are low: Yonkers, .3 per cent; Newark (28 cases), .1 per cent. The other cities stand below these figures.

Our estimate for all cities is .1 *per cent, or one case in a thousand*. This is practically the percentage, also, for New York City.

3. IMPETIGO, OR IMPETIGO CONTAGIOSO

This contagious skin disease, frequently transmitted through towels, perhaps, is characterized by several large flat scabs, or pustules which break early and form crusts. It most frequently appears on the face.

Some of the frequencies are: Summit, .5 per cent; Norwood, 1.4 per cent; Winchester, 4 per cent; Montclair, 2 per cent; Hoboken, .4 per cent; Waterbury, 1.8 per cent; Yonkers, .5 per cent; New Bedford, 1.6 per cent; Cambridge, .2 per cent; Lowell, .8 per cent; Jersey City, .3 per cent excluded; Newark, 1 per cent (nurses made 7,389 treatments, and perhaps found many more new cases); Boston, 2 per cent.

The average is 1.3 per cent. Impetigo is probably more common than this figure represents.

The Montclair estimate of 2 *per cent* seems nearer what may be found on careful examination of all elementary children in each city.

4. INFLUENZA, GRIPPE

Boston is the only city which gave very much attention to this ailment. Only six other cities mention it, with very few cases, some of which were excluded from school.

The Boston percentage is .1 or .2. We cannot tell, for sure. The inspection really covered the entire city, and even the parochial school ailments are included. The number of children was about 90,000 to 95,000. This would reduce Boston's percentages based upon the 61,000 inspections. For the inspected cases were picked out by the teachers and nurses as suspected cases from the entire number.

We leave the probable number of cases actually present in the elementary school population for any one year in the average school system at a *maximum of* .1. This is only a guess and the figure will very probably be changed with further investigation.

5. PEDICULOSIS, LICE—BODY AND HEAD. COLUMNS 145-6

This is the most frequent ailment found in the schools, with the exception of teeth. It can be said without qualification that no other school ailment takes up so much time and money spent for doctors and, especially, nurses. It is a national disgrace, of course, that this is true; but it is only by facing such facts that we shall eradicate them. Some cities started medical inspection for the special purpose of ridding the schools of this pest. The President of the Board of Education at South Manchester told the writer that the plan was started in the hope that one year or two would eliminate the evil entirely. After eight years, the ailment is comparatively common, although reduced in frequency, and limited to a few families. The real remedy for such ailments lies in the homes.

A girl with long hair suffering from this ailment may be treated and found free from pediculi or their eggs (nits) and called cured, and yet in a week or two be found infected again. This makes our number of cases much larger than the number of children affected. Just how much the percentages should be reduced for these considerations, we cannot say. It is probable that a child should be counted but once, no matter how many recurrences there are during the school year. Each of the latter can be counted by the nurse as inspected or treated, or both.

The percentages for the figures as recorded are as follows: Summit, 11 per cent; S. Manchester, 4 per cent; Norwood, 24 per cent; Winchester, 9 per cent; West Orange, 4 per cent; Montclair, 10 per cent; Meriden, 7 per cent; Newton, 5 per cent; Brockton, 15 per cent; Hoboken, 4 per cent; Schenectady, 17 per cent; Waterbury, 37 per cent; Yonkers, 4 per cent; N. Bedford, 10 per cent; Trenton, 1 per cent; Cambridge, 2 per cent; Lowell, 4 per cent; New Haven, 14 per cent; Syracuse, 6 per cent; Rochester, 2 per cent; Providence, 13 per cent; Jersey City, .7 per cent; Newark, 11 per cent; Boston, 12 per cent.

The average is 9 per cent.

The actual number of different elementary school children afflicted with this ailment in any one school year is certainly *not over 5 per cent,* or one in twenty, about two pupils to every school room, some time in the year on the average. The entire difficulty illustrates the practical impossibility of getting accurate facts from these reports, as they were then and are still made up. The number of cases is astoundingly large, at any rate, and it is hard to believe that on the average about five per cent of the elementary school children have head lice at some time in each school year. (Body lice are very infrequent.)

6. RINGWORM, TINEA, BODY AND SCALP

This is another ailment due to a fungus vegetable parasite, and one which takes time and care to cure. Children under strict supervision and regular treatment may be permitted to attend school. The treatment in England, Scotland and Germany is more efficient than in this country. The chief method of treatment there is by the X-rays. Diagnosis is made with the help of microscopic examinations. The best reports of ringworm among school children are found in the 1910 and 1911 reports of the Chief Medical Officer of the Board of Education of England.

We may be sure that the ailment exists in every city of any size, although we have cities in this list of twenty-five that have made no mention of it. In Summit the cases are not separated from other skin ailments. Scalp cases are more difficult to cure, and this makes desirable separate records of the two cases. The English report shows average length of exclusions from school for this ailment as high as *ten months*. At Croyden, England, "the more severe cases have been dealt with by X-ray treatment for several years past, and the average time taken to complete the cure of 425 children has been 73 days, i. e., approximately, 10 *weeks*." Bradford, England, seems to give the best general handling and treatment of this ailment. Eighteen cities or urban districts have X-ray apparatus at their school clinics or have portable apparatus. In several places *ringworm classes* have been established. This gives at once isolation from other children, and a continuance of schooling.

In none of the American cities studied in this investigation has there been any special study and investigation of this ailment, of which the writer has learned.

Some of the frequencies are: In the first five cities, only 10 cases given separate mention, six of whom were excluded; Montclair (33 cases), 1 per cent; Meriden, .2 per cent; Hoboken (36 cases), .4 per cent; Yonkers (14 cases), .1 per cent; New Bedford (174 cases), 1.5 per cent; Trenton, only 5 cases reported by one nurse, probably 15 in all, .1 per cent; Cambridge, .1 per cent; Providence, .2 per cent; Jersey City (38 cases excluded), .1 per cent; Newark, 3,209 cases excluded and treated by nurses, 13 per cent (doctors' cases, 162, or .7 per cent); Boston, 504 cases, .6 per cent.

In Newark, the supposition is that 13 per cent does not represent the number of different children affected, but the number of exclusions, many children probably having been excluded more than once.

The average percentage seems to be near .4 per cent. Any estimate of the actual number of new cases found or to be found in any one school year, not counting any child twice, is precarious. Probably .4 *per cent, or* 4 *cases in a thousand* would be near the truth.

7. SCABIES, ITCH

The folk term, "slow as the seven years' itch," indicates what has been the character of this ailment in the past. Now, with sulphur ointment and baths and boiling or baking of clothing, the ailment can be killed in a few days. If care is not taken to kill off every itch-mite burrowing along or resting in the skin, the ailment may, however, last indefinitely. In the minds of many physicians the ailment is associated with promiscuous sex relations but, as in the case with venereal diseases, the innocent are not immune and are frequent victims. As with pediculosis, constant scratching and marks of scratches on the body or in the web between the fingers, are common indices. Many cities now keep sulphur ointment for cure and furnish prescriptions, as in the cases of vermin and other parasitic ailments.

The ailment is even more common than ringworm, and very much more distressing to the children afflicted. Some of the frequencies are as follows: Only 8 cases given separate mention in the first three cities; Winchester (12 cases excluded), .8 per cent; Montclair, .4 per cent; Mt. Vernon, .2 per cent; Hoboken, .2 per cent; Schenectady, .2 per cent; Waterbury, .1 per cent; Yonkers, .12 per cent; New Bedford, 1.1 per cent; Trenton, .1 per cent; Cambridge, .2 per cent; Syracuse, .3 per cent; Rochester, .2 per cent; Providence (158 cases excluded), .5 per cent; Jersey City, .04 per cent excluded; Newark, .8 per cent excluded; Boston (648 cases), .8 per cent.

The average number of cases or exclusions is almost .5 per cent. The average number of cases among the elementary school population in any one year, counting no case twice, is probably *not far from four in a thousand, and perhaps five,* say five. The variation is perhaps from about 2 to ten in a thousand, although, as we have found it, the variations among physicians and nurses exceeds, and so covers up, the probable variability of cities.

8. TONSILITIS, QUINSY

This is generally a rather mild ailment, but may easily be confused with the beginnings of several of the infectious diseases; so it is treated almost as rigorously as if it were a suspected case of diphtheria. The Chicago Board of Health rule is: "Cases of tonsilitis must be excluded on the clinical evidence alone, and throat cultures made for further diagnosis." It is possible for school purposes that the ailment may be placed with "sore throat" cases, since the treatment is practically the same. Where doctors and nurses are sure that the case is tonsilitis and not some other form of sore throat, probably infectious, we have a situation where it is better to have separate mention of the ailment.

The ailment is an inflammation of the tonsils which may become an abscess. The latter, by breaking while the patient is sleeping, may, according to Dr. Ditman (Home Hygiene and the Prevention of Disease), cause suffocation.

The abscess should be opened by a physician. The prevention is along the line of preventing colds, keeping up the resistance, and removing enlarged tonsils.

A few random frequencies among the elementary school populations are: Montclair, 1.3 per cent; Hoboken, .7 per cent; Yonkers, .15 per cent; New Bedford, .6 per cent; Trenton, .2 per cent; Cambridge, .4 per cent; Rochester, .15 per cent; Jersey City, .06 per cent; Newark, 1.4 per cent; Boston (1,200 cases), 1.3 per cent.

The average is .76 per cent.

The actual number of new cases among the elementary school population during any one school year is *probably not less than one per cent.* This is our estimate. Most cities simply have not found or have not recorded all cases. Less than a half per cent would certainly indicate this.

We have now completed our survey of minor infectious and parasitic ailments. Mulloscum contagiosum is a very uncommon ailment belonging to this group, but is not given separate mention, only 10 cases having been found in one city, Newark. Hookworm is another serious ailments of this class that should be included wherever the ailment is found, and it seems rather widespread, from reports of Rockefeller Institute.

B. Infectious Diseases

Here we come to those diseases which started medical inspection by health departments in cities, in the effort to control the causes of death among the young. Beginning here, the study of causes and prevention has led to the discovery of a host of previously unrecognized ailments which are only indirectly, if at all, death-dealing. Present studies seem to show that the school is a very slight factor in the spread of infectious ailments, contrary to the long accepted opinion; and, moreover, it is surprising how small a percentage of the actual cases are found in the schools before they are found and isolated by the parents or family physicians. It must be remembered in this list that many of the cases reported or excluded are only suspected cases, and that a further large number of children have been excluded because they lived in the same family or same house as those ill. An interesting and needed study is the comparison of the number of cases reported by boards of health and the numbers found which actually prove to be cases by the school medical service. Another dangerous factor is the disease carrier, a child healthy but carrying and distributing deadly bacilli.

We should expect that those inspectors and nurses under boards of health would make a better showing in the field we have now entered than the board of education medical workers, for some of them have done little else than look out for and report suspected infectious cases. Let us see.

In the table, excluded cases are marked X, merely suspected cases where so reported are marked with a ?.

1. CHICKEN POX, VARICELLA

Summit school health officers found no cases of infectious or suspected infectious diseases in the schools during the year, so far as I could learn from the superintendent and physician. Many cases actually occurred, however, and the schools learned of them through reports of the Board of Health. In the writer's opinion, infectious diseases are a most important part of school health records whether cases are found in the schools or not. The number of cases of these ailments and the number of deaths of children of school age in each city are given in the tables.

Eight children were recorded as having had treatment in Norwood, .7 per cent of the elementary school children; Winchester, 1.3 per cent; West Orange, .7 per cent excluded; Montclair, 1 per cent; Meriden, .2 per cent; Mt. Vernon, only one case excluded; Newton, .4 per cent probably excluded; Hoboken, .3 per cent; Trenton, with a large medical force, comparatively, and over 10,000 examinations and 8,000 special inspections, and 3,400 inspections by nurses, found only one case of chicken pox in the schools; Cambridge, 1.5 per cent; no cases reported by either Lowell or New Haven, the latter under the Board of Health;

Syracuse, .2 per cent; Jersey City, .06 per cent; Newark, .9 per cent (better reduced to .5 per cent by using not the number examined but the entire elementary school enrollment, perhaps, as explained elsewhere); Boston (based on elementary school enrollment, not on number of inspections of special cases, counting 500 cases found by both doctors and nurses), .5 per cent. Several cities have been left out, as usual, because the cases found were so few. They are not representative.

The average frequency of suspected, or actual, cases found in the schools according to these summaries is .6 *per cent.*

This, perhaps, is near the actual number of cases. We cannot tell. Many of the cases found are children who have returned, in the opinion of doctor or nurses, too early.

2. DIPHTHERIA

This dread disease is well known, but science is gaining control over it. The most remarkable decreases in fatalities from any disease are shown for this ailment and typhoid. The 1911 Board of Health report for Boston (pages 182-3) shows that in 1878 and many years later the ratio of deaths to number of cases was nearly half, and not as low as one out of three dying until 1889. But since 1907 the percentages have ranged around 6 per cent, or about one out of fifteen or sixteen cases ill.

Still there were 2,081 deaths from this disease in 1910, so it is yet a very real terror.

Fewer cases or suspected cases of this ailment were found than in the case of chicken pox, 17 cities giving practically no mention of it. The most interesting struggle with infectious diseases in any of the cities during the years studied, was probably that in South Manchester. There were three epidemics; one of diphtheria, one of scarlet fever, and another of measles. The school physician was paid an extra hundred dollars to inspect almost all the children in the school system once a week for six weeks. (See 1911 report.) The health department and the school officials did everything possible but the epidemics continued almost as if nothing were being done. Here we have a very severe test of school medical inspection.

One thousand six hundred and ninety-three days were lost from school by 65 pupils ill with diphtheria, and 1,666 by 73 others quarantined because of exposure, a total of 3,359 days (number excluded, 138). For scarlet fever other pupils exposed, 2,728 days, a total of 4,731 days. there were lost by 75 children ill, 2,003 days, and for 71 Diphtheria occurred in 67 families and scarlet fever in 65.

In the inspections, 585 cultures were taken, of which 143 were reported positive. Some *carriers* were found. These tend to show that the number of cases might have been greater had there not been the extraordinary inspection. On the whole, however, it shows the probable limitations of school inspection. The schools were not closed during the epidemics, as would be the cases in many cities so stricken. Three children died of diphtheria. At the end of the year it was found that the promoted pupils had lost on an average 32 of the 186 school days, while the non-promoted pupils lost 52 days, a difference of six and ten weeks. How much was due to the absence, or from the absence for any one cause was not worked out.

The President of the Board of Education, also a member of the State Board of Education of Connecticut, estimated the cost to the schools of the diphtheria and scarlet fever cases at $2,500; these and lesser infectious diseases like measles, at $5,000, all as "ineffective expenditures." And "we cannot estimate the cost to individuals, but assuming that the serious diseases cost the parents even so low an average as $25.00 each, and the milder ones $10.00, the direct burden would be in excess of $5,000. If to this were added the expenses of the health officer, and wages lost by quarantines, we are certainly within the truth in affirming that *the sum of the expenses of the town and individuals incidental to contagious diseases was not less than* $12,000, *and may easily have been* $15,000."

The Superintendent's reasoning on the cost of these ailments is shown in the following paragraph:

"The total time lost by children who were excluded for the two diseases was 8,090 days. This was equivalent to 44 school years for one pupil or 44 children lost one year's schooling. Last year it cost $35.28 to promote one pupil one grade. The 44 years of time lost had a money equivalent of $1,552. If to this sum should be added the time lost by the children where parents kept them from school through fear of contagion, and those who were absent several days awaiting the report of cultures, it is probable that the sum would be about $2,500 in time lost by children absent from school. To this must be added the time consumed by teachers in attempts to bring the absent pupils back to grade which always contains an element of loss to the pupil who attends regularly and who loses some portion of the teacher's time expended upon the irregular pupil. . . . There were three deaths from diphtheria, a loss to parents which cannot be computed in money and in which they have the sympathy of the whole community."

We give a page or so to the Manchester experiment to show the loss of this and other such ailments to a community; to indicate the limitations in even a small city on health control; and to point out a statistical fallacy which has become very frequent in school reports since Ayres' publication of such fiscal studies, also fallacious.

On the second point, Mr. Cheney urges a contagious hospital for the town, and to the writer suggested the very great need of state-pay for laborers who were quarantined in order that effective quarantine may be obtained. "The infectious ailments spread in the mills, principally, and on the streets, and not so much in the schools," he said.

This points out one of the most important problems of medical inspection—that of preventing the spread of infectious diseases outside of the schools, on the streets and in the backyards where children play, and also in the mills and stores where children, youths and adults work. It is a nice problem for real investigation.

The *fiscal* fallacy is in computing the cost of retardation and school absence without any regard to the economic laws of diminishing expense.

Illness, exclusion, and quarantine absence can be relatively accurately computed; and, with great care, some notion of the effect these absences have upon retardation can be ascertained; the costs to parents and other such items can be worked out; but the loss to a school system in money from either absence or retardation cannot easily be discovered, and has not yet been done. School rooms are not very often used to their full capacity all the time. The pupils of any building who fail in any one year, can usually be accommodated in the same building. Promotions are made somewhat upon the basis of the number of vacant seats to be in the room above. Pupils in the upper grades of crowded districts are frequently sent to other schools where there are uncrowded class rooms. A number of children fail at each annual promotion, and *yet no new teachers are employed for the building, no extra heat or janitor service is used, very little extra is spent for supplies.* The cost of retardation or of absence almost *disappears* in the situation. How much the school system is increased by the damning up process of retardation, i. e., how many more teachers and rooms are necessary, has not yet been discovered.

All the statistical studies of this kind, on the Ayres' plan, go on the assumption that the situation is the same as if all the children failing of promotion each year were put off into separate buildings from the main system. Thus Cleveland reports (1911 Report) an appalling loss of school money due to retardation. The method is that of multiplying each year of retardation by the per capita cost of the schools. Such figures may have some pragmatic value in obtaining public support, but they are undoubtedly very far from the truth. The law of diminishing expense would show that the "wasted expenditures" were probably quite small. So that we must be very careful in computing the money cost of illness absence. The most important losses here are other than financial.

FREQUENCY OF DIPHTHERIA

South Manchester, 4.2 per cent; none of the other cities have more than one to four cases until we come to New Haven with 164 cases, .7 per cent; next three cities with no more than four cases; Jersey City, .1 per cent; Newark, .1 per cent; Boston (nurses reporting 752 cases), .8 per cent of total elementary enrollment. The total number of cases in the city of Boston in 1910 was 2,453.

The average of these cases would be relatively insignificant. The general tendency can hardly be told from these figures. *The average is, however,* .1 *per cent.* The number of cases, or suspected cases, is very small compared with the total number of cases among school children.

In New Bedford, for example, in the year 1910 no *suspected* cases, even, of diphtheria were found in the schools by the medical inspectors, but there were reported to the other division of the Board of Health 96 *cases with* 24 *deaths.* The inspectors did find 5 suspected cases of measles or children who had returned too early; but there were reported to the contagious disease division 697 *cases and three deaths.* Likewise the school inspectors found 7 cases or suspected cases of scarlet fever in the schools, while there were reported to the board of health from the homes 246 *cases and* 5 *deaths.* All of these persons with the ailment probably were not school children and ages are not given by ailments, but a very large proportion undoubtedly were. We leave it with an estimate of 12 cases in a thousand to be found in a school. All cases among school children should however be recorded on the school card.

3. MEASLES

This ailment is very much better reported. The death rate, too, is very much lower; 1,112 cases are reported by doctors and 214 cases by nurses in all the cities, a percentage of the entire elementary school population, counting 1,200 cases of all the cities, amounting to about .3 per cent. The variations are from zero in seven cities to 5.6 per cent in Meriden. The latter included suspected cases of German measles.

The probable frequency of cases actually present in a school year in an average city is perhaps *around* .4 *per cent.*

Any study of reports shows consternation and surprise on the part of superintendents that medical inspection and examination has done so little in controlling this ailment. It simply shows that in this respect as in many others the school must reach out into the home and other phases of life in order best to serve the children.

Another point is, too, that very little is yet known regarding children's diseases. Medical schools do not emphasize the subject and most medical research has been in other fields.

4. MUMPS

Of this ailment only 671 cases or suspected cases are reported by physicians and 1,388 cases by nurses, the Boston nurses contributing nearly all of these, 1,344 cases. (Boston then had 35 nurses and now 46.) The ratio to the entire elementary school population in all cities is (counting 1,400 cases) .3 per cent plus, a little more than for diphtheria.

No city stands out here, except perhaps the nurses' cases in Boston, 1.5 per cent. How many of these were duplicates we know not, since the Boston report gives only bare summaries. Some of the other frequencies are: Newark, .2 per cent plus; Rochester, .08 per cent; Yonkers, .8 per cent; Hoboken, .08 per cent; Meriden, .3 per cent; Montclair (nurse, 22 cases), .7 per cent; West Orange, .3 per cent.

The average is *about* .4 *per cent, about* 4 *cases among a thousand pupils* in a school year.

5. SCARLET FEVER

The total number of cases in all cities reported by school doctors is 832 and by nurses 676, nearly all of which were furnished by the Boston nurses. Probably the only places where cases were duplicated by the nurses' reports are Syracuse, Providence and Boston. Subtracting a hundred cases for this and we have left at least 1,408 cases among an elementary school enrollment of more than 414,000, making a frequency of .3 per cent plus. Some of the frequencies are: South Manchester, nearly 5 per cent; Winchester, 1 per cent; New Haven, 2 per cent; Jersey City, .2 per cent; Newark, .05 per cent on total elementary enrollment; Boston, .6 per cent.

The average for these higher cities is over 1 per cent. We leave the frequency estimate at .4 *per cent as a minimum ratio.*

6. TRACHOMA, GRANULATED EYE-LIDS

Of this terrible ailment, so guarded against at our ports of entry for immigrants, there were reported by the inspectors 281 cases in all cities, and 104 cases by the nurses. Subtracting 75 cases from the combined sum we have left probably 310 cases, about .08 per cent, not far from one case in a thousand.

Summit had .2 per cent nearly; Mt. Vernon, over .1 per cent; Yonkers (70 cases), .5 per cent; New Bedford, .1 per cent plus; Cambridge, .1 per cent; Jersey City, .07 per cent; Newark (100 cases treated), nearly .2 per cent.

We leave the *estimate at* .1 *per cent, or one case in a thousand.* Cities reporting fewer cases than this conservative estimate very probably haven't found the cases. The cleanest little cities have cases of the ailment. Yonkers, as with almost all the ailments, shows very high percentages, abnormally so in some cases. The indications are that perhaps no city more needs an enlarged force of doctors and nurses. Those in authority have said, however, that Yonkers is such a nice town that much medical service in the schools is not needed. The number and character of the ailments point in the other direction.

7. PULMONARY TUBERCULOSIS, CONSUMPTION, PHTHISIS

This ailment is surprisingly uncommon among school children when the large number of adults having it are taken into consideration. A number of the cities had, and more now have, open air schools for anemic children and those with tubercular symptoms or tendencies. Probably the most complete reports of such work occur in the South Manchester, Cambridge and Newark reports. The von Pirquet skin test with tuberculin is used in several places to assist the doctors in diagnosis. There was much hope that the Friedman antitoxin would prove a radical remedy and make possible the rapid cure of all such cases. The open air schools would still have their place, however, for weak, anemic, poorly nourished children can best be fed and cared for in such a school. The great need is, of course, more fresh air and outdoor life for all schools. What is good for a few afflicted, is good, and can be provided, for all, so far as air is considered. Open window schools are growing in numbers. A lowering of the temperature of heating coils in the fan rooms, so that air will not be baked and made over-sultry, is also very much to be desired, and will give more nearly outside conditions. Moistening the slightly heated (not much over 60 degree) air, is also necessary in forced systems to complete more nearly the supplying of the best outside conditions.

Probably 420 cases of suspected cases of pulmonary tuberculosis were found in the 25 cities, a percentage of .1 per cent. Montclair had about 44 children in her open air school, but the number responding to the tuberculin test is not given. It is very difficult to tell, and it is not perhaps important to tell exactly, how many children in the schools actually have pulmonary tuberculosis. It is not very hard for the experienced physician or nurse to pick out those children who run a very great chance of getting it and dying from it before they are thirty years of age. If conditions can be so modified that no actual cases may be found, a very great deal in the essential work of prevention may be done. Here is one of the principal places where the nurse's work for home hygiene counts in the best way. School feeding is very important; good home feeding is better if it can be secured. Home ventilation, cleanliness, a chance to play out-of-doors, comfortable clothes, no over-work or home study, decent treatment, plain nourishing food, and the remedying of physical defects and ailments: all these come within the province of the modern school nurse in the service of the coming generation.

8. TUBERCULOSIS OF BONES, JOINTS, AND OTHER PARTS OF THE BODY

Enlarged glands, when they are found tubercular, may be placed in this group. Pott's disease is a common name for tuberculosis of the spine, the ailment which causes the hunch-back. Fortunately this form of tuberculosis is very infrequent, only about 50 cases being reported in all the cities, about .01 per cent. Cambridge reports 27 cases, nearly .2 per cent; and Trenton has a showing of 18 cases, or over .1 per cent. If all the cases existing were actually found the percentage would *not be far from* .1 *per cent in all cities*. We leave it as about that sum.

9. WHOOPING COUGH, PERTUSSIS

This is quite a common ailment and frequently the cause of death. It is one of the greater *time*-killers of all school ailments, the period of exclusion being so long. There was a combined number of 693 cases reported in all cities of which probably 133 were duplicates, leaving 560 cases, a frequency of over .1 per cent (.13 per cent). Nine cities do not mention the ailment, five boards of education and four boards of health. It would seem that the latter would give especial attention to this infectious ailment. Some of the frequencies are: Winchester, .6 per cent; Montclair, .7 per cent; Meriden, .5 per cent; Hoboken, .2 per cent; Providence, .07 per cent; Jersey City, .07 per cent; Newark, .14 per cent; Boston, .3 per cent.

The higher percentages average .3 per cent.

The probable number of children in the schools during the school years is perhaps above even this figure. But we leave *the probable percentage at .2 per cent* of the elementary school children, or *two in a thousand.*

SUMMARY OF ALL 54 AILMENTS

We have now come to the end of a long, hard journey through the ills of childhood. We have tried to look facts in the face and see what these ailments are, how frequent they are, how various cities do their duty by the ailing children, and we have also endeavored to develop *tentative standard percentages which may be the start toward coefficients which will prophesy as accurately as insurance tables about how many of these various ailments we may expect in a school population, and how far below the normal various cities pass.*,

The various percentages are collected on a later page. The deaths from these ailments will also be given, as well as a summary of the exclusions. We do not enter into the laborious task of testing each city by these percentage standards to determine its relative standing. If anyone cares to do this the figures are given for it. Rigorous comparisons are perhaps not now needed so much as ideals, norms, and efficient methods of administration.

TABLE IX.

TOTAL NUMBER OF AILMENTS REPORTED FOR THE 25 CITIES, IN ORDER OF FREQUENCY.** PROBABLE TRUE NUMBER OF AILMENTS.

	Physicians.		Nurses.		Sum. of cases by M.D.'s and Nurses.		Per-cent-age of total.	Estimated number of serious ailments among 1,000 ele-mentary pupils.*a*
1	Dental, teeth defects	26,737	Pediculosis, lice	32,701	Pediculosis, lice	47,932	18.6	50
2	Enlarged tonsils	17,423	Wounds, sores, sprains, etc.	16,763	Dental defects, teeth	42,330	16.4	660
3	Pediculosis, lice	15,231	Dental defects, teeth	15,593	Enlarged tonsils	22,689	8.8	60
4	Adenoids and nasal obstruct.	12,657	Eczema	10,435	Adenoids and nasal obstr.	21,968	8.5	50
5	Eyesight, vision defects	8,506	Adenoids and nasal obstru.	9,311	Wounds, sores, sprains, etc.	19,625	7.6	150
6	Glands enlarged, adenitis	6,527	Impetigo contagioso	9,254	Eyesight, vision defects	13,184	5.1	70
7	Skin ailments, minor	3,003	Enlarged tonsils	5,266	Impetigo contagioso	12,019	4.6	20
8	Conjunctivitis, "pink eye"	2,984	Eyesight, vision	4,678	Eczema	11,768	4.5	7
9	Malnutrition, debility, etc.	2,982	Conjunctivitis, "pink eye"	3,955	Glands enlarged	7,126	2.7	10
10	Wounds, sores, sprains, etc.	2,862	Ringworm	3,769	Conjunctivitis, "pink eye"	6,939	2.6	30
11	Impetigo contagioso	2,765	Anemia	2,035	Skin ailments, minor	5,117	1.9	15
12	Anemia	1,968	Skin ailments, minor	2,014	Ringworm	4,702	1.8	4
13	Tonsilitis, quinsy	1,900	Eye ailments, minor	1,752	Anemia	4,003	1.5	10
14	Deafness, hearing defects	1,856	Mumps	1,388	Eye ailments, minor	3,595	1.4	20
15	Eye ailments, minor	1,843	Scabies, itch	1,106	Malnutrition, debility	3,474	1.3	20
16	Eczema	1,351	Tonsilitis, quinsy	926	Tonsilitis, quinsy	2,826	1.1	10
17	Scabies, itch	1,193	Diphtheria	761	Deafness, hearing defects	2,614	1 plus	5
18	Measles	1,112	Deafness, hearing	758	Scabies, itch	2,299	.8	5
19	Ringworm	933	Ear discharge, otitis m.	678	Mumps	2,059	.8	4
20	Heart defects	842	Scarlet fever	676	Scarlet fever	1,408	.5	4
21	Scarlet fever	832	Glands enlarged	599	Ear discharge, otitis m.	1,404	.5	15
22	Pharyngitis, chronic s. throat	810	Chicken pox	516	Measles	1,326	.5	4
23	Chicken pox	746	Nalnutrition, debility	492	Chicken pox	1,262	.4	6
24	Ear discharge, otitis m.	726	Eyes crossed, strabismus	483	Diphtheria	1,097	.4	2
25	Skeleton, orthopedic defects.	673	Whooping cough	367	Heart defects	983	.3	9
26	Mumps	671	Colds, bad, coryza	300	Pharyngitis	924	.3	3
27	Catarrh, rhinitis	652	Palate defect	280	Eyes crossed, strabismus	920	.3	7
28	Headache, migraine, etc.*	603	Lungs weak, not tuber.	272	Catarrh, rhinitis	903	.3	10
29	Mentality defective	537	Favus, yellow scalp sores	264	Skeleton, orthopedic	837	.3	2
30	Eyes crossed, strabismus	457	Catarrh, rhinitis	251	Palate defects	721	.2	7

TABLE IX—(*Continued*).

TOTAL NUMBER OF AILMENTS REPORTED FOR THE 25 CITIES, IN ORDER OF FREQUENCY.** PROBABLE TRUE NUMBER OF AILMENTS.

	Physicians.		Nurses.		Sum of cases by M. D.'s and Nurses.		Per-cent-age of total.	Estimated number of serious ailments among 1,000 ele-mentary pupils.*a*
31	Palate defects	441	Tuberculosis of lungs......	245	Whooping cough	693	.2	2
32	Speech defects, stuttering...	433	Urinary, eneuresis	220	Headache, migraine, etc....	688	.2	15
33	Nervousness, chorea	411	Measles	214	Mentality defective	678	.2	10
34	Abscess, boils, etc.........	385	Cleanliness needed	200	Colds, bad, coryza.........	675	.2	30
35	Colds, bad, coryza	375	Skeleton, orthopedic.......	164	Lungs weak, not tubercular	497	.19	5
36	Diphtheria	336	Laryngitis	157	Nervousness, chorea	483	.18	2
37	Whooping cough	326	Sore throat, acute.........	156	Tuberculosis of lungs......	468	.17	1
38	Bronchitis	318	Bronchitis	148	Bronchitis	466	.17	1
39	Trachoma, gran. eye lids....	281	Heart defects	141	Cleanliness needed	456	.17	20
40	Spine, curvature and posture	260	Mentality	141	Speech defects	433	.16	9
41	Cleanliness needed	256	Nose-bleed	139	Abscesses, boils, etc.......	414	.16	5
42	Ears, minor ailments.......	250	Stomatitis, mouth ulcers...	120	Sore throat, acute	386	.15	2
43	Sore throat, acute.........	230	Pharyngitis	114	Trachoma, gran. lids.......	385	.15	1
44	Lungs weak, not tubercular..	225	Trachoma, gran. lids......	104	Laryngitis	380	.15	5
45	Tuberculosis of lungs.......	223	Spine, curvature and posture.	92	Spine, curvature and posture	352	.13	8
46	Laryngitis	223	Headache, migraine, etc....	85	Ears, minor ailments......	317	.12	5
47	Influenza, grippe	147	Nervousness, chorea	72	Favus, yellow scalp sores...	314	.12	1
48	Stomatitis, mouth ulcers...	112	Ears, minor ailments	67	Urinary, eneuresis	299	.11	2
49	Nosebleed	103	Influenza, grippe	65	Nose-bleed	242	.09	2
50	Sex ailments and habits....	103	Abscesses, boils, etc........	29	Stomatitis, mouth ulcers...	232	.09	1
51	Urinary, eneuresis	79	Sex ailments and habits....	9	Influenza, grippe	212	.08	1
52	Favus, yellow scalp sores...	50	Rheumatism	7	Sex ailments and habits...	112	.04	10
53	Tuberculosis of the bones...	48	Tuberculosis of bones......	1	Tuberculosis of bones......	49	.02	1
54	Rheumatism	40	Speech defects	0	Rheumatism	47	.001	1
		127,037		130,334		257,371	100.00	1,419

* Symptom. ** This table was constructed before the ailment tables were finally corrected with an adding machine. *a* Number to be found in a school year among 1,000 pupils.: 333 pupils with no ailments, 333 pupils with teeth defects only, 334 pupils with teeth defects and other ailments.

CHAPTER NINE

SPECIAL PHASES OF MEDICAL INSPECTION IN THESE CITIES

In preceding chapters we have attempted to describe and evaluate the general administration of medical inspection, the work done, and the ailments or disorders found among the school children of these cities, especially those of the elementary schools. In this chapter it becomes our problem to set forth briefly some of the good features of these various medical inspection systems which are somewhat in the nature of departures from the simple inspection and examinations by doctors and nurses. Here we shall abandon the method of analyzing the data strictly by cities, and treat the problem on the basis of topics or phases emphasized. Some of the most important of these phases are: the methods of getting treatments and the starts toward school clinics, the various preventive methods carried on by this department, the examinations of children for work certificates, and the various more or less scientific investigations of the work carried on by the departments themselves or by other school officials.

1. TREATMENTS AND SCHOOL CLINICS

The special methods of procuring treatments adopted by medical inspection systems in these cities are both private and public. The schools carry on and pay for certain work, and also encourage or permit a good deal, but not enough, voluntary assistance by private organizations and individuals. The ideal towards which the schools seem everywhere to be directed more or less vaguely is that of *a first class school clinic* accessible to every child and free to every child who wishes, or whose parents wish him to take advantage of free diagnosis and treatment, with the further provision that *every child in a school system must either privately or publicly be placed in good physical condition, and that there can be no escape from this provision. Compulsory education seems absolutely to involve compulsory health* and the most economical way for a community to provide adequate diagnosis, prevention and continued or immediate treatment is through the instrumentality of the public schools. Why the schools have gone so long with almost utter disregard for the health and normal physical development of their compulsory charges, argues "a certain blindness of human nature" in the teaching profession. This blindness, of course, which is almost a physical defect, comes naturally out of the excessive isolation of our public schools and teachers from the real life and needs of our people. *When we take the attitude that the problems of the people and the nation set the problems for the public schools, then we shall have a sensitive adaptation of our educational systems to the real life of the times and the children to be adapted.*

Some of the essentials of adequate school clinics seem to be the following:

1. Convenience to the pupils, perhaps for the most part and for the ordinary cases, in every school.
2. Several divisions in the charge of specialists with nurse assistants.
3. These divisions, for a beginning, may be:
   a. *Dental,* in charge of dentists. They will examine the cases sent in by nurses and doctors and give such treatment as is necessary, and such advice for dental care as seems desirable, requesting parents, nurse, and teacher to see that they are followed. Small charges may be made where they seem desirable, though this seems as unnecessary as voluntary payment for the free text-books and other supplies furnished by the schools. It is as much the advantage of the state to have

children in good health as it is to have them get a certain amount of schooling. And the retarding effect of the various ailments may well cause such waste of time and money as to pay for adequate clinical provisions.

b. *Surgical,* in charge of surgeons. This division will, with parents present as much as possible (and parents will come out to clinics when they will not come to mere examinations), remove such adenoid and tonsillar tissues, and make such other dressings and simple surgical treatments as good judgment provides. Cases of strabismus (cross-eye) and defects requiring operative treatment, may well be handled by this division.

c. *Medical,* in charge of regular physicians. This division will devote itself to the diagnosis of referred cases of many ailments not falling to other divisions and the giving of skilled treatments. With scalp ringworm cases needing X-ray treatment, or with discharging ears, favus cases, or any other of a host of ailments which cannot adequately be handled by the nurses, we have cases for this division of the clinic. The Dunfermline (Scotland) clinic has such divisions and the medical division reports a very large amount of work for a small city of about thirty thousand population.

d. *Ocular,* for eyes and vision, in charge of oculists. This division will handle both the treatment of eye ailments and make careful vision tests of referred cases, furnishing either prescriptions alone or prescriptions with the proper glasses. Providence has already entered this field and every city must undoubtedly follow.

e. *Medical gymnastics* division, if this is not correlated with the department of physical education.

f. *Psychological* division, for testing backward children.*

Practically no school system of this country has yet a clinic so well worked out and so paternal as this, although there are a number of approximations to it, and we can see scattered over the country its various elements. We shall begin our further study of the cities with the various means of:

A. Public School Treatments.

The work of the nurses consists of assisting the doctors at examinations and making vision and hearing tests, inspecting the children, visiting the homes to help get preventive measures and treatments, taking the children to free dispensaries or to private physicians, and, finally, in *treating* the children themselves.

Physicians are, for the most part, prohibited from making treatments, and the nurses' work in the field of treatment ranges in these cities from almost zero up to the large amount of work done in Newark and a few other cities. In some cities, as at New Haven, all the medical supplies and instruments were carried in the nurse's bag, and consisted of:

An ear syringe, a sponge, some bandages, two small basins, combs for pediculosis, bichloride tablets, olive oil, zinc ointment, sulphur ointment, scissors, tongue depressors, and a graduated glass.

From such small beginnings and less, the work ranges upward to finely equipped medical inspection rooms, or school clinics, in many or most of the school buildings and with a large list of medical supplies kept at the central supply department and furnished to schools on the requisitions of principals along with other school supplies. For Boston,

*Dr. Cornell suggests other divisions in his book.

the requirements for a medical inspection or "nurse's room" are given in the report of the School-house Commission, and the writer got further details at first hand. The plans for the room and the equipment are much the same as those already given in a former chapter for Summit. The same room could be fitted up for the use of one or more of the above-mentioned clinical divisions, of course, if they could work at different times of the week. The medical inspection cabinet and desk combined in use at Boston is the best seen, but a better one was found by the writer in the Department of School Buildings in the City of New York. The latter is a desk cabinet, with two doors below, and drawers and pigeon holes above which are shut up and covered over by a glass covered door which lets down by hinges at the bottom and makes a writing desk. The top of the cabinet is covered with slate to keep it, like the top of the desk, from being injured by chemicals or medicines.

Most cities have in one to all of the buildings emergency medical cabinets, made up by the nurses or doctors, or sold complete by various medical supply houses. A very small one found in New Bedford consisted of a tin box ten inches square and about three inches deep and containing the following:

An envelope containing scissors, safety pins, and pincers, a handbook of first aid to the injured, absorbent cotton, gauze, a tourniquet, a package of bandages, six bandage rolls, a box of adhesive plaster, and camphenol ointment.

Such emergency outfits are, of course, unnecessary where the same materials are kept in an adequate medical inspection cabinet in each medical inspection room in each school.

The list of instruments furnished physicians and nurses vary very much. In Providence, the school dentist carries with him seventy-five teeth mirrors, so two rooms of children can be examined at a visit without any disinfection of mirrors. Hoboken has perhaps the longest list of medical tools furnished each school, and the entire list of medical supplies may here prove interesting and suggestive:

1. Jones' platform scale with height standard attached.
2. Ear speculum.
3. Nasal speculum.
4. Head mirror.
5. Teeth mirror.
6. Tuning fork.
7. Stop-watch, one for each physician.
8. Spirit lamp.
9. Tape measures.
10. Enamel basins.
11. Tongue depressors.
12. Applicators.
13. Absorbent cotton.
14. Gauze.
15. Gauze bandages.
16. Lysol.

Among the lists found in other cities the following further items were found:

Rubber gloves.
Medicine droppers.
Forceps.
Uniforms for nurses.
Carrying bags for nurses.
Clinical and other thermometers.
Hair brushes.
Bath caps.
Tooth picks.
Graduate glasses.
Surgeon's needles.
Bandage jars.
Adhesive plaster.
Mercury bichloride tablets.
Peroxide of hydrogen.
Disinfectants, sulphur naphol, etc.
Green soap.
Boric acid.
Jamaica ginger.
Ammoniated mercury.
Creolin.
Marigold ointment.
Witch hazel.
Chamois skin.
Tongue depressor handles.
Vaccination shields.
Enameled table with glass shelves.
Couches.
Medical cabinet.
Chairs.
Floor mats, rugs, and pillows
Water heaters.
Paper and cloth towels.
Aromatic spirits of ammonia.
Collodian.
Larkspur, for pediculosis.
Kerosene, for pediculosis.
Creasol, for pediculosis.
Sulphur ointment, for scabies.
White precipitate ointment.
Iodine.
Sweet oil.
Wood alcohol.
Toothache drops.
Oil of cloves.
Argyrol.
Comp. stearate of zinc.
Vaselene.
Comphenol.
Adreniline.
Powdered chalk.
Glycerine.
Boric acid ointment.
Vinegar, for pediculosis nits.
Vitagen.
Alcohol.
Muslin.
Vision test charts.
Tooth brushes.
Eye glasses, spectacles.
Combs.
Sterilizing outfits.

A study of the *cost* of all these items was made in each city, and comparisons made. Cities that have tried to get along by buying an article or two of local druggists whenever they were needed have wasted a good deal of money. Twenty-five cent hair brushes, for example, have been sold for $1.50 to the unsuspecting. Changes in certain cities have since been made along these lines in the direction of having budgets made up each summer for the following year, and then the lists offered for bidders from anywhere. The big supply houses have come into the market and sold all the supplies very reasonably. This is desirable economy in line with other business improvements.

A list of the medical inspection supplies furnished in quantities at Newark is here appended:

FOR MEDICAL INSPECTORS

Absorbent cotton, ½ pound packages, J. & J. Red Cross.
Alcohol, grain—95 per cent.
Tongue depressors, in packages of 100.
Bandages—2-inch by 10 yards, J. & J. Linton gauze.
Bichloride of mercury tablets—7½ gr. (100 tablets in a bottle).
Tincture of green soap, 6-ounce bottle.
Glass jar, 2-quart.
Eleven different forms, envelopes, prescription pads, etc.

FOR SCHOOL NURSES

Absorbent cotton, ¼-pound packages, J. & J. Red Cross.
Bandages, 1-inch by 10 yards, J. & J. Linton gauze.
Bandages, 2-inch by 10 yards, J. & J. Linton gauze.
Adhesive plaster, 2-inch by 10 yards, J. & J. "Z. O."
Alcohol, grain—95 per cent.
Plain gauze, 1 yard long, 1 yard wide, J. & J. Red Cross.
Argyrol, 5 per cent.
Bichloride tablets, 7½ grains.
Flexible collodian.
Iodine, tincture.
Lysol.
Sulphur ointment.
Sweet oil.
Stearate of zinc (powder, in boxes).
White precipitate.
Zinc ointment.
Bottles, 4-ounce, with corks.
Ciliary forceps, No. 1628.
Clinical thermometer.
Ointment jars, 4-ounce.
Tooth picks.
Three blank forms.

FOR PRINCIPALS

Cotton, bandages, adhesive plaster, aromatic spirits of ammonia, and three blank forms, reports on medical inspection.

FOR SANITARY INSPECTOR

Formaldehyde.
Kerosene oil.
Alcohol, wood.
Cotton, American Beauty.

Two blank forms, one a report of sanitary inspection of schools and of disinfection, and the other a report of visits to the homes of quarantined pupils.

FOR SUPERVISOR OF MEDICAL INSPECTION

Form 93, a permit for children to attend school.

Here we have about the best that has been worked out in the way of medical inspection supplies, and this list will probably soon be added to if the efforts for a first-class school clinic are successful.

PRESCRIPTIONS

It has been found necessary and desirable to print prescriptions in the various languages of the city population for a rapidly increasing list of school ailments. Some of these are at present for: pediculosis (lice), ringworm, impetigo, scabies, caring for the teeth (tooth powders), and home and school advice which amounts to prescriptions for a great variety of other ailments of a simple character. We have not begun to discover what a wide field of health education of *adults* exists in the form of well written and illustrated pamphlets, not to mention lectures, home-visits, etc. A very valuable book for home treatment and prevention of disease has been written by Professor N. E. Ditman, M. D., of Columbia University, entitled "Home Hygiene and Prevention of Disease" (Duffield & Co.). It is in the form of a small one-volume cyclopedia, beginning with "Abscess" and ending with "Wry-neck," and comprising very practical and scientific advice on practically every phase of health in the home. I wish I had the power to place it in the hands of every parent, intelligent enough to read the newspapers, in America. The book, of course, shows the limitations of home treatment and shows also where the expert skill of medical men is necessary; but it does clear away a great deal of the superstition, inscrutability, and awesomeness of ill health, and shows plainly and simply each individual's responsibility for prevention and cure. Such knowledge is, of course, essential matter for our high school courses in hygiene, but the pupils there do not get such knowledge or acquaintanceship with such book-tools, because they are so busy cramming comparatively useless information.

HEALTH LECTURES

A new departure is the wide range of simple health lectures being given in many cities. Newark has four or five hundred a year, given by specialists or persons well qualified to speak, on a great variety of health topics. The nurses and doctors also give a great number of health talks to the children and teachers of the schools. Stereopticons, tuberculosis exhibits, dental exhibits, budget exhibits, and moving pictures all are, or can, be enlisted to bring to the people the health knowledge which is essential to the saving of many of their lives or, at least, conserving and developing their efficiency in their daily work. Denison's "Helping School Children" (Harper's) is filled with suggestions for promoting the health of the school children and their friends and relatives.

SCHOOL OCULISTS

We have mentioned the school oculists at Providence, and the splendid work they are doing for getting scientific diagnoses and accurate prescriptions and glasses for school children. The school oculist is bound to come. These two oculists at Providence give "two afternoons a week at the Fourth Ward Room for examining eyes," for which they receive an annual salary of $300. Several more are needed more afternoons a week.

SCHOOL NEUROLOGISTS

Providence has also the only school neurologist in this group of cities, or had at the time of this study, 1910-11. Neurologists or psychologists for testing mental defectiveness and helping with the education of backward and feeble-minded children are, however, to be found in a number of cities (e. g., Cleveland and Los Angeles) in the United States. Their work could hardly be called treatment perhaps, but they are naturally mentioned in this place.

B. Treatments by Private Organizations

The great field for private health assistance to the schools has been, it seems, in the field of school dentistry.* We find groups or associations of dentists in many cities volunteering their services.

The following cities of the twenty-five had more or less of such voluntary work during the years of this study: Summit, Norwood, Winchester, Montclair, Meriden, Waterbury, New Bedford, Trenton, Cambridge, Lowell, Rochester, Newark, and Boston.

In Winchester, the dentists have a schedule of half days on which they will work and give their services, with nominal charge of twenty-five cents a case. In Cambridge and Waterbury the school department has purchased chairs at, or less than, $300 each, which are taken from school to school as needed. In New Bedford, the Health Department spent $600 for a chair and other equipment for a dental room, all of which was placed at the disposal of the volunteer dentists. In Trenton, a very finely equipped dental suite of rooms is furnished by the city in the new city hall. Such volunteer work goes along very well for a time, but it almost invariably breaks down unless a city responds soon and takes the new institution over. No city at this late day really needs to be *convinced* by volunteer demonstration of the necessity of such clinics or divisions of clinics. The experience of cities the world over is at the disposal of any who wish to meet the vital health problems of the people.

In Boston, as related, the new Forsythe Dental Dispensary, left as a private bequest, is almost extensive enough to handle the dental problem of all the children of Boston

*Providence alone, also, had a school dentist employed by the city.

up to the age of sixteen years. It is not thought that existing dentists will suffer by such an arrangement. Rather they will gain through an adult population educated in the realization of the value of good dental services.*

Other voluntary forms of health and medical service to children are: the provision of clothing brought in by the children and distributed by the nurses, the provision of outings on private bequests, as at Brockton, the provision of free eye-glasses, the various hospital and dispensary forms of treatment offered and given so freely and generously to all that the nurses bring or send, the feeding of the undernourished, the open-air schools, and a great host of other ways almost too numerous to mention but springing into being wherever the school officials or the public or both together are genuinely sensitive to the health needs of the actual children in the public schools and homes.

The administrative solution of the problem of treatment is to organize it, get it into the hands of skilled and permanent workers, and to make the private work become public policy as soon as its value is demonstrated, thus leaving new fields open for private initiative. School superintendents frequently do not see very clearly the health needs or are so engrossed with other matters that they have no time for health essentials. This and a number of difficulties has led the writer to advocate a thorough integration of all health agencies in a school system, in one department of hygiene, and under one physician, physical-educator, or educational hygienist, who will be responsible for the health and normal physical development of the school children. The divisions of such a department may well be, as before stated, and first so listed by Dr. Woods, I believe: Medical Inspection, School Sanitation, the Teaching of Hygiene, Physical Education, and the Hygiene of Teaching. The salary for such a man will be near $3,000, not less; but ways can easily be devised in many cities for acquiring him with little extra

*Such dental work in public schools will be found well treated in Gulick and Ayres' Medical Inspection of Schools, 1913 edition, and Cornell's Health and Medical Inspection of School Children.

expense, and several small cities can go together to get one man as they now do in New England for superintendents. In the country, there can well be a county, or township Director of Hygiene who can examine children, direct nurses and assist physicians, and promote all health phases which are now so terribly neglected in many or most country schools.*

II. PREVENTION IN MEDICAL INSPECTION

The principal preventive work of such systems is, quite largely, that of *education,* finding incipient cases of all kinds, the provision of open-air schools, and the general co-operation with or the correlation of all phases of educational hygiene above mentioned.

OPEN-AIR SCHOOLS

Open-air schools were found in South Manchester, Montclair, Schenectady, Cambridge, Providence, and Newark. Detailed studies of the administration, cost, equipment, methods and results were made in all cases, but we cannot here go into the matter in detail. Readers are referred to the excellent reports of some of this work at South Manchester, Cambridge, Providence, and Newark. At Providence the work is in charge of the Board of Health and its enterprising director, Dr. Chapin. Reference is also necessarily made to the valuable little book by Dr. L. P. Ayres on the subject.

Open-air schools are not filled with *tubercular* children as many suppose, but with the poorly nourished, the anemic, the delicate, and incipient or *potential* cases of tuberculosis. The advantages lie in the way of segregation from other pupils of the schools, of special adaptations of work and regimen to individual needs, of the good, fresh air, of the special loving kindness which is the best medicine for some children, of the more natural motor activity, and, especially, of better feeding in many cases. It is hard to regulate the feeding of selected children in a big school system, but it is

*See the plan for such work in the last chapter.

easy when these children are brought together in segregated groups and all participate in the same activities.

Open-air schools are not expensive, but are more costly than the usual school system. The expense is an added one, because many or most of the children leave vacant seats in the schools. But it is worth all that is spent on such provisions for three reasons, at least:

a. It shows how necessary fresh air is in the schools and in the homes for all children and all adults. It gets school officials and parents to thinking of how to provide natural, "uncooked" air to all children at all times. It shows teachers that they do not have to live in a torrid, desert atmosphere to be comfortable and happy. It shows principals and janitors that more dependence can be placed upon *radiators* for heating the rooms instead of raising the temperature almost entirely by overheating or cooking the air *before* it goes into the fans and the ventilating flues. It shows that *moisture* should be added, perhaps in the form of steam pans, and in large quantities, and adequately registered and regulated by accurate humidometers, keeping the air at about 55 per cent saturation, and a temperature in the fan room of about 62 degrees and in the school rooms about 65 degrees Fahrenheit. It shows the value of *open-window* rooms where pupils simply keep on their warm wraps, and breathe directly the outer air, without recourse to an elaborate fan system. But this leads us into school sanitation in these cities, and that is another chapter.

b. It shows the importance of *nourishment* for the debilitated children, and a fundamental essential for all children, besides the fresh air.

c. The *cost* is of the nature of a stitch in time saving nine. Most children in open-air schools that have been followed up carefully for some time after such a school has been given up or the children had to leave the school (as in the case of the lamented Dr. Arthur T. Cabot's study and follow-up work in Boston) have either died in early life or indicated that they had few years yet to live. Long continued open-air schooling for a number of pupils will probably raise their resistance enough to make their span of life normal and save to society all the expense incurred in their upbringing. The work can probably be planned so such saving to the school system alone will more than balance the cost of open-air schools.

It is probable, also, that properly devised systems of ventilation in the *regular* schools and proper attention to *nourishment,* eradicating the *coffee-habit,* etc., will make unnecessary any elaborate extension of such schools. It may be well to call them open-air *hospital* schools and provide them for only a few, while placing the greatest emphasis on adequately caring for the ninety-and-nine.

MEDICAL CONSULTATIONS FOR MOTHERS

The child-hygiene departments of some of our progressive boards of health begin their care of children with conception and follow them up in one way or another until the age of the work certificate. This is the boast of Boston and of several other cities. In Newark, the *school* medical inspection department has provided free medical consultation for mothers with infants or pre-school children. The development of this work and the good results which have followed show that, without invading the fields of the health department, the school department, through its medical inspection and whole hygiene department, can help to insure the efficiency of the children in the schools long before they set foot in even the kindergarten. Such extensions in response to genuine community needs can in the long run be only benificent, regardless of the croakings of the worshippers of the god of things as they were.

SCHOOL BUDGET EXHIBITS

For educational and civic purposes, an annual budget exhibit in which the hygiene department of the schools is represented, may be of very great value. Hoboken is the only city having had such an exhibit in the year of study, among the twenty-five cities. The exhibits consisted of charts showing the effects of various ailments on school progress *a la* Ayres, the number of children affected with various ailments, the duties of the parents in various directions, and a sample of each kind of the medical supplies on burlap screens, with the cost of each below. Those desiring to utilize this means of reaching the parents, the tax-payers and the children may well correspond with the New York Bureau of Municipal Research, which has been the father of the movement.

DISINFECTION OF SCHOOLS AND HOMES

A good deal of money is spent in this line of prevention of the spread of infectious ailments. Montclair has a system of sending formaldehyde gas through the vents of the ventilating system, so that a few minutes after an evening audience has used a school auditorium, for instance, the fumes so fill the room that it is impossible for a person to remain in it. Costly paintings hung on the walls of the auditorium visited there, but no damage to them or to anything else seemed to follow. However, with all the work and expense, the value of such disinfection is being seriously questioned by medical men. The dependence upon this mode of prevention is waning, and we very much need such studies as those of Dr. Chapin of the Providence Board of Health, those of Kerr in London, and of Professor Jordan of the University of Chicago.*

EXAMINATIONS FOR WORK CERTIFICATES

A number of the cities are coming to a realization of the importance of seeing that every child, requesting a work certificate at the age of fourteen, is guarded from going into the struggle of employment with a poor health equipment. Such medical examinations by Boards of Health or Boards of Education frequently get treatments where all former efforts have failed, and in some cases for the first time discover defects that will prove a serious handicap unless properly corrected. Boston seemed to be doing most in this

*See reports, and the 1912 N. E. A. volume, article by Professor Jordan giving many references, and bringing up a number of these correlated problems of school infection.

field in the year of the study, and the writer learned much about the work by watching the examinations, and talking with the examiners afterwards. In only rare cases has it been necessary to refuse such certificates although many are postponed for a time.

Adequate vocational guidance will of course, in each school system, take this health matter into consideration, relieving the health department of the obligation. Adequate medical inspection throughout school life will greatly lessen the *need* for such service, as a special piece of medical work. This of course argues power of compulsion in the lower grades, and this is what the New Jersey law grants and many cities in one way or another enforce—that parents may be compelled to place the child in good health condition, or permit the school authorities to do so. Courts, truant officers, and cruelty to children societies all work together for the benefit of the child where any parent or guardian is stubborn in his ignorance.

HEALTH INVESTIGATIONS BY DEPARTMENTS OF MEDICAL INSPECTION

The work of medical inspection and all health work must be placed upon an adequate *scientific* basis, commensurate with the newer sciences of medicine and education. A city that does not or cannot adequately and accurately *measure results* in this field is condemned at the start.

Very few cities have made anything like scientific investigations of what was being accomplished, what ought to be accomplished, or what was necessary to do the work. Boston probably made more investigations during the years studied than all the other cities put together. If this volume does nothing else but show that there are an immense number of problems in educational hygiene which demand immediate solution by careful inductive methods, its existence will have been justified.

Some of the problems investigated in Boston were:

1. The relation of temperature of school rooms to the number of cases of anemia found in the rooms.

2. The relations of ill-health and physical defects to retardation.

3. The ventilation and temperature of school rooms.

4. A study of 5,000 choreic children, and their school progress.

5. An investigation of the number of tubercular children in the schools, and their environments.

6. A study of the number of cases of defective vision and hearing in the schools, and the number of children wearing glasses, etc.

These and other studies were made by this one city. Unfortunately none of the studies was carried through to completion by the use of such rigorous inductive methods as would insure accurate and comparable results, so the results of the findings are not here quoted. They were regarded as starts only in the right direction, and have not all been published by the school authorities in public journals, although mention of some of them can be found in the Annual Report of the School Committee for 1910.

The same could be said for the studies of the relationship of ill-health to retardation in South Manchester, Brockton, Mt. Vernon, Schenectady, Hoboken, and elsewhere. The field is so new and the problems are so complex and the requirements of adequate investigation are so great in the way of time, labor and ability, or special technique, as well as a number of years of study of results, that we have as yet little definite knowledge of this health work in the schools. And yet there is *promise* in every study, valuable data possibly to lay by, certain tendencies showing themselves, and certain skill and interests arising in the investigators which are the things to be prayed for if we are to get a science of educational hygiene or a science of education. We can close this section with no finer thoughts than those expressed by Dr. Cruickshank, now Director of Hygiene for the Board of Education of Scotland in his

1911-12 report of medical inspection in Dunfermline, Scotland:*

"It behooves them (the Trustees) to renew their interest and redouble their energies in seeking to establish thorough and scientific methods of investigation into the problems which bear upon the numerous ailments and nutritional deficiencies of the school children of their town. It has to be borne in mind that this work is scientific in the highest sense of the term; that it can be done only by those who have the necessary scientific training; that it entails much difficult and accurate work, and that the results cannot be made immediately apparent, as is the case with the effects of treatment. It is, of course, essential that scientific investigation should both precede and accompany scientific prevention. The days of empiricism in medical science are over, and no true progress can be made in the applications of medical science to the problems of education unless their points of contact are subjected to minute and accurate investigation. In all probability medical science, more than any other, will exert an influence on future educational movements."

BOARD OF HEALTH VS. BOARD OF EDUCATION ADMINISTRATION

Our data are too inaccurate and too narrow in scope to permit any conclusive statement as whether the boards of education or the boards of health should, in general, have charge of school medical inspection. As we have gone through the various phases of medical inspection efficiency, we have found a number of instances where in essential matters the boards of health, even though they are much older in the work, on the average, fall decidedly below the efficiency of the boards of education. We have attempted to get data on enough items by which to rate the various cities

*The writer has recently distributed 100 copies of this excellent report bound in boards free of charge to persons in this country known to be interested in school health and working for it, and a thousand more have been promised by Mr. Andrew Carnegie.

and the separate divisions in Boston and New Bedford where both bodies participate. Some of the most essential data we could not get, so the table showing the relative ranking of the cities is merely suggestive of a method. It is, however, interesting to see how the boards of health place themselves at the bottom of the list in the efficiency series. My judgment of the probable true ranking of the cities on all items, i. e., on their general efficiency, need not be accepted.* My best judgment is, however, that, with perfect records and accurate efficiency ratings for all elements, the ranks of any one of these cities would not be raised or lowered more than five points in the twenty-five. The hardest problem in the ranking was to get and decide upon what were real efficiency data, and the next hardest problem was the relative place of Summit and Newark. The weakness of the latter was in the entirely insufficient number of nurses in comparison with the number of physicians, and lack of provision for high school inspection, while Summit was weak in records and used up a large share of the nurse's time for the work of attendance officer, though the latter is to be commended in general even if it isn't strictly health work. Definite steps have since been taken in Newark to reverse the numbers of doctors (38) and nurses (8), with the doctors to be district supervisors only, while the high schools are now pretty well cared for by male and female doctors, with nurses.

The medical officers of boards of health are, of course, jealous of their powers, and will not agree with my opinion, nor with my data, perhaps. A good example of their point of view is given in the April, 1913, *American Journal of Public Health* in the Report of the Committee on Medical Inspection of Schools and School Children, Dr. S. H. Durgin, probably the first regular school medical inspector of the United States, of Boston, as chairman, and Dr. G. F. Kiefer, of Detroit, as acting chairman. They make a strong stand for board of health control, but present no data in proof and practically no arguments. On other points, their

*See page 254 for a tentative ranking of the cities on several obtainable items.

conclusions, based partly on a questionnaire, agree very markedly with conclusions already published by the writer.

The *general impression* which one gets in going about from city to city and studying the work of both departments is unstatistical but impressive to the one experiencing it. On the whole there is marked contrast in efficiency, with several exceptions, between the two departments, in favor of the boards of education. Politics plays a larger part in the work of most health boards, and this seems to vitiate much of their endeavor.

To summarize many scattered points we give below some of the chief:

ADVANTAGES AND DISADVANTAGES OF BOARD OF EDUCATION AND BOARD OF HEALTH ADMINISTRATION OF MEDICAL INSPECTION

I. BOARDS OF HEALTH

A. Advantages.

1. They can, if efficient, knit up school health with the general health problem.
2. They can medically inspect parochial and private school pupils as well as public school pupils. This Boards of Education can do only where state laws laws force parochial schools to obtain adequate medical inspection. It is then relatively easy, as in Milwaukee, for the boards of education to get control of this important service.
3. They can employ medical inspectors on full-time, giving them other public health work during a large part of the time.
4. They can keep physicians and nurses in touch with all phases of the health problem in the city and community, by having them share in the work of infant-mortality education in the summer, district nursing of adults, infectious disease quarantine, etc.
5. Where there is an efficient, interested superintendent of health, not too much engrossed with other health matters, there is a possibility of more expert supervision of school doctors and nurses, and

more progress toward a wide range of curative and preventive measures, than in a school system where the school superintendent has no medical specialist as supervisor of educational hygiene or of medical inspection, and is himself little interested or learned in school hygiene.

B. Disadvantages.

1. They seem to be more under the dominance of partizan politics, and not as efficient as are the boards of education.
2. They introduce an extraneous element into the schools, making it impossible to get the best kind of co-operation on the part of teachers and principals in health work.
3. They make impossible the organization of all the five divisions of educational hygiene into one organic department.
4. They do not seem to get the money and the support for medical inspection, as well as do the boards of education.
5. They look upon the school health work in a more limited way, generally, e. g., from the standpoint of infectious diseases, or merely that of finding the ailments of children. Curative and preventive measures, and the treatment of the child, his health and his education, as a whole can hardly be obtained, and are little emphasized by such boards.
6. They seems to be weaker in the way of educating the parents through school meetings, medical inspection, pamphlets, etc.
7. They very largely omit complete physical examinations of the children.
8. They are especially weak in providing an adequate number of school nurses, in comparison with boards of education. Counting Boston and New Bedford, and leaving off the first three of our cities, making 11 boards of education and 11 boards of health participating in this work, we

find the sum of the nurses for the boards of education is 59, while the sum for the boards of health is only 16. Boston now has over forty nurses and other boards of education have been increasing their numbers. The ratio now would show a greater disparity. Our cities do not well show this tendency because they were selected on the basis of their having nurses. In proportion to the number of pupils and using the data for the entire country given by the Sage Foundation we should have a far greater disparity. The Boards of Health Committee, above mentioned, strongly urges the use of school nurses, however, and recommends as many as three nurses for each doctor, and, at least, one for each 1,500 to 2,000 pupils, and only one physician for each 3,000 pupils, where he gives only part time to the work as they recommend further.

9. The best types of medical inspection records, reports, and statistics are being devised by boards of education and they are using nomenclature that is more easily understood by the people to whom reports are made than those made by boards of health. However, in these cities we find in two places the ailments of children given in greater detail and in better organized form, than is the case with most of our board of education reports. Cleveland and Newark, on the board of education side, and Providence and Boston on the board of health side would stand out in this one particular.

10. Board of *health* administration of school medical inspection is contrary to the tendencies of the times, most cities taking up the work in recent years putting it into the hands of the school officials, and whole states, with the unfortunate exception of Minnesota, going in this direction, e. g., New Jersey. The problem evidently will soon be a dead issue except for scattered cities in the east

When states get general directors or Supervisors of (Educational) Hygiene, as many soon will, we shall have the agencies in the school departments to make board of health administration unnecessary anywhere.

II. BOARDS OF EDUCATION

A. Advantages.

1. The work can be done by boards of education without loss to them or to the boards of health and without as great waste of public expenditure. The boards of education can supervise the health conditions while individuals are immature and in public schools with good means of control. Boards of health can do the same for individuals in private life; and, according to Winslow, in his excellent article in the June, 1913, *North American Review,* this will soon be extended to factories and other institutions where individuals congregate. In this article also, "Efficiency in the Public Health Campaign," the day is foretold when most if not all medical work will be public and not private work. This tendency will add so much to the boards of health that the work of the schools will not seem so large in comparison.
2. Our data seem to show that, in general, these, and perhaps most, boards of education take up this work with more energy and general efficiency, with marked exceptions, of course.
3. The work can be integrated with both the scholastic and the general physical development of the pupils better when in the hands of one board, the board of education necessarily, than when the work is divided up. Schools must discover their own health needs in order to do away with the present isolation of parts and to go about physical education, school sanitation, etc., in a rational manner.
4. The work can be done more cheaply to the city, not

only because of the greater efficiency of boards of education but because the introduction of supervisors of hygiene as herein planned will make possible several economies and the avoidance of needless duplication of efforts by the two boards.

5. As is now done in New Jersey, boards of health can medically inspect parochial and private schools, leaving to the boards of education the inspection in public schools. Whether boards of education should take over the inspection in these outside schools is a question. France and Germany exercise a great deal of control over such institutions, making them conform to general state requirements, and it will undoubtedly be necessary to place the inspection of all school children in the hands of the public educational authorities.
6. Boards of education seem to get better support from the public, although they do not have the powers over the people in general held by boards of health. The schools are closer to the public purse and will be more apt to make the work progress as it should.
8. They emphasize the ailments which, though not directly or immediately death dealing, are, nevertheless, very serious in their effects, and yet are largely neglected by boards of health.
9. The number of part-time doctors with no other school health work can be greatly reduced. Supervisors of hygiene and more nurses will help solve the problem, and the time will soon come when the entire medical force in the schools will in some way be made full-time workers like the teachers. Physical education and departmental teaching of hygiene may be mentioned as probable occupation for the time not spent in physical examination each day. With a morning of three hours daily for medical inspection and examination this would

leave only the short afternoons to provide for. Educational hygiene courses, abridging the long M. D. preparation and physical education training, may make possible the introduction of such men at salaries around $1,800 to $2,000. Full-time workers are undoubtedly to be desired, though we have no data with which to prove it.

B. Disadvantages.

1. At present, lack of competent medical supervision of the work of doctors and nurses.
2. Lack of control over parochial schools, with the possibility of uncontrolled infection in these schools spreading to the public schools.
3. Lack of correlation with the general health problems of the community such as the control of midwives, milk and water purity, infant mortality, tuberculosis, infectious diseases, and general extra-school health difficulties.
4. Lack of sufficient police and compulsory power in forcing parents and guardians to place their children in reasonable health condition for school attendance, in most places.
5. Possibility of under-emphasis of the health factor by an institution traditionally specialized for mental and scholastic development.

GENERAL

In general, we conclude that while for the present there are a number of cities where this work is now in the hands of excellent men, such as Dr. Chapin of Providence, and may well remain there for a time, and while it is desirable for cities, rural communities, and states to keep the work in the hands of boards of health for the benefits of variety and testing of these suggestions, still, for the most part, and for all cities and states taking up the work for the first time, and for any localities where it seems quite evident that the work should be taken out of the hands of the boards of health,—in all these places, the administrators of medical inspection of public schools should be the boards of education.

TABLE XI.

FURTHER EFFICIENCY DATA.

	Ratio of Ailments to Number of Elem. Pupils.		Average Number of Ailments for Each:		Average No. Physical Defects Reported by Each:	
	M.D.'s.	Nurses.	Equated M.D.	Nurse.	Equated M.D.	Nurse.
	219	220	221	222	223	224
1.	73 p.c.	....	802	....	576	....
2.	83	....	1,507	....	1,185	....
3.	52	133 p.c.	2,067	2,090	2,067	1,191
4.	29	133	446	2,173	164	509
5.	28	9	219	140	122	140
6.	44	30	718	1,002	123	283
7.	56	8	771	330	561	315
8.	9	...	133	....	....	....
9.	12	53	124	3,218	94	2,686
10.	11	53	749	4,475	749	3,268
11.	33	4	546	429	419	196
12.	16	24	2,141	1,350	1,541	292
13.	51	13	2,093	1,545	456	39
14.	49	46	7,800	5,756	6,766	4,793
15.	8	39	313	4,646	21	3,342
16.	57	2	917	132	836	132
17.	20	9	516	719	366	525
18.	14	7	178	830	132	351
19.	8	19	359	1,443	....	....
20.	8	8	119	718	11	....
21.	81	8	1,597	697	1,542	603
22.	15	15	1,221	5,090	702	953
23.	2	.1	59	11	....	11.
24.	48	69	*966	4,854	302	450
25.	45	48	520	1,252	15	522
	854					
	.34					

*Dividing by average number of physicians for the year, 28.5.

TABLE XII.

Estimated Minimum Needs: (1911-1912 data)

	Medical Examiners.*		School Nurses.		Total salaries for Director at \$2,000 to \$3,500, m. examiners and nurses.
	Number.	Total salaries at \$400.	Number.	Total salaries at \$750-\$825.	
1.	1	....	1	\$750	\$2,750
2.	1	....	1	750	2,750
3.	1	....	1	750	2,750
4.	1	....	1	750	2,750
5.	1	....	1	750	2,750
6.	1	400	2	1,850	5,050
7.	2	800	2	1,620	5,450
8.	2	800	3	2,400	6,200
9.	3	1,200	3	2,400	9,600
10.	3	1,200	4	3,150	7,350
11.	4	1,600	6	4,800	9,400
12.	4	1,600	6	4,800	9,400
13.	4	1,600	6	4,800	9,400
14.	5	2,000	6	4,800	9,400
15.	5	2,000	8	6,300	11,300
16.	5	2,000	7	5,550	10,550
17.	6	2,400	9	7,050	12,450
18.	5	2,000	7	5,550	10,550
19.	9	3,600	13	10,050	16,650
20.	7	2,800	11	8,700	14,500
21.	9	3,600	13	10,200	16,800
22.	12	4,800	16	12,600	20,900
23.	14	5,600	19	14,850	23,950
24.	21	8,400	30	23,250	35,150
25.	35	14,000	50	28,500	50,000

*Director counted as one assistant physician or medical examiner.

Much of these sums on the right may be saved by the elimination of physical training teachers, truant officers, summer playground directors, etc.

p.c.—per cent.

TABLE XIII.—APPROXIMATE RANK OF EACH OF THE CITIES IN EIGHT HEALTH ITEMS.

	No. of City.	RANK IN: Nurses in proportion to El. pupils. Column.	No. of M.D.'s Equated.	M.D.'s and nurses; proportion to El. pupils.	M.D.'s in proportion to El. pupils.	No. of Cases Found and Reported. M.D. Aver. for each equated M.D.	Aver. physical defects each equated M.D.	Aver. physical defects for each Nurse.	Aver. total for each Nurse	Final Rank.		Final Ranking of cities on 8 items.	Estimated probable true ranking, taking in all known factors: Cures, supervision, frequency of inspection, examination, reports, etc.	
	1. Summit, N. J. ..	1	3	2	3	10	9	..	..	1		1. Summit	1. Newark	
	2. S.Manchester, Conn.	2	14	6	1	6	5	..	..	2		2. S. Manchester	2. Summit	
	3. Norwood, Mass....	5	19	11	6	4	2	5	8	3		3. Norwood	3. Winchester	
	4. Winchester, Conn.	3	10	4	13	17	15	10	7	5		4. Newark	4. Meriden	
	5. W. Orange, N. J..	4	1	1	14	20	18	18	20	12		5. Winchester	5. Boston	EH
	6. Montclair, N. J...	7	12	9	11	13	17	15	13	13		6. Meriden	6. S. Manchester	
	7. Meriden, Conn....	8	6	8	5	11	10	13	19	6	EH	7. Boston	7. Trenton	
H	8. Mt. Vernon, N. Y.	10	8	10	21	22	..	..	..	23	H	8. Rochester	8. Norwood	
H	9. Newton, Mass. ...	12	2	7	19	23	19	4	6	10		9. Yonkers	9. Montclair	
	10. Brockton, Mass. ..	18	22	23	20	12	7	3	5	15	H	10. Newton	10. Rochester	H
	11. Hoboken, N. J...	20	13	15	12	14	12	16	18	20		11. Trenton	11. Hoboken	
H	12. Schenectady, N. Y.	9	24	22	16	2	4	14	11	14		12. W. Orange	12. Brockton	
H	13. Waterbury, Conn..	23	20	21	7	3	11	19	9	17		13. Montclair	13. Jersey City	
	14. Yonkers, N. Y....	24	25	25	8	1	1	1	1	9	H	14. Schenectady	14. Yonkers	
EH	15. N. Bedford, Mass..	22	18	20	22	19	20	2	4	21		15. Brockton	15. W. Orange	
	16. Trenton, N. J....	13	11	13	4	9	6	17	21	11	H	16. Providence	16. Newton	H
H	17. Cambridge, Mass..	16	17	18	15	16	13	8	15	18	H	17. Waterbury	17. Schenectady	H
	18. Lowell, Mass. ...	21	5	12	18	21	16	12	14	19	H	18. Cambridge	18. Cambridge	H
H	19. N. Haven, Conn..	15	21	19	23	18	..	..	10	24		19. Lowell	19. Providence	H
H	20. Syracuse, N. Y...	19	9	14	24	24	22	..	16	25		20. Hoboken	20. Lowell	
H	21. Rochester, N. Y..	17	15	16	2	5	3	7	17	8	H	21. N. Bedford	21. Waterbury	H
H	22. Providence, R. I...	25	23	24	17	7	8	6	2	16		22. Jersey City	22. N. Bedford	EH
	23. Jersey City, N. J.	11	16	17	*25	25	..	20	22	22	H	23. Mt. Vernon	23. Syracuse	H
	24. Newark, N. J....	14	7	3	9	8	14	11	3	4	H	24. N. Haven	24. Mt. Vernon	H
EH	25. Boston, Mass.....	6	4	5	10	15	21	9	12	7	H	25. Syracuse	25. N. Haven	H

This table is inserted only to show a method of estimating the relative efficiency of cities in this work. Data on some of the most important items, such as treatments and cures, could not be obtained for comparative purposes.

MEDICAL SUPERVISION OF HIGH SCHOOL PUPILS

As before mentioned, the health of high school pupils is very much neglected and this part of our school system is yet very much of a mere intellectual and academic machine, running by mediæval and formal-discipline formulæ. In preparing the section on The Hygiene of the High School for Professor Johnston's new book on High School Education, Volume Two, Scribner's, the author has been interested to go more deeply into the health problem of the high school. As I show there, the best data obtainable, from Newark and from Washington, D. C., as well as from my study in Montclair, disclose the fact that there is a surprising amount of sickness and physical defectiveness in the high school population. Carrying through the fifty-four classes of ailments, summarized as to frequencies among a thousand elementary pupils in the last chapter, we find that the high school figures are close up to those for elementary pupils. We are by them reminded of G. Stanley Hall's statement in his volumes on Adolescence that the high school period is a period of a low death rate but of a high morbidity, or sickness, physical defectiveness, rate.

Our high school pupils are to be the leaders in their respective communities and they should be fitted for efficient leadership by adequate health protection and education while in school. Nothing less that careful, scientific and rigid medical supervision will ever show our high school teachers, too, that pupils of this age are other than disembodied mentalities and book-reading machines.

I have called attention to valuable statistics on this problem in Professor Johnston's volume. I give here the results of work done by Dr. Thos. Storey with the young men in the secondary and lower collegiate departments at the College of the City of New York, reprinted from the Pedagogical Seminary for December, 1912. Dr. Storey has also shown by his records that such medical inspection and examination does not throw an excessive burden upon the free dispensaries and clinics but furnished in the year ending

June, 1911, patients for 1,100 professional men who received over $12,000 compensation. (See the Proceedings of the Sixth Congress of the American School Hygiene Association.)

RESULTS OF DR. STOREY'S FOLLOW-UP SYSTEM OF MEDICAL INSPECTION OF HIGH SCHOOL STUDENTS

The success of this "follow-up" system during the year ending June 1, 1912, may be seen in the following statistics:

	1st term	2d term
Number of boys given instructional advice	1051	936
Number of diagnoses followed up	1542	1409
Number of conferences necessary to follow up all cases.	2244	1925
Number of "diagnoses" recorded as "under treatment".	73	158
Number of "diagnoses" recorded as having "secured treatment"	1298	1093
Number of "diagnoses" recorded as having "refused treatment"	11	10
Number of "diagnoses" recorded as having "promised treatment"	108	102
Left college	48	40
Number of parents refusing to secure treatment	9	8
Number of individuals warned	328	290
Number of individuals debarred	71	92
Number of individuals reinstated	67	85
Number of individuals that remained debarred	4	7
Number of dentists consulted privately	273	256
Number of physicians consulted privately	189	139
Number of opticians consulted privately	22	16
Number of dental clinics attended	3	4
Number of hospitals attended	24	14
Number of students securing private dental service	320	310
Number of students securing private medical service	204	147
Number of students securing the service of opticians	15	18
Number of students securing free dental service	8	13
Number of students securing free medical service	4	5
Number of students securing free clinical service (dental)	0	3
Number of students securing free clinical service (medical)	10	11
Number of students securing service of optician free	0	0
Total number securing private service	539	475
Total number securing free service	22	32
Total number for whom home treatment was sufficient.	490	429

These statistics justify the following conclusions:

First. Our medical inspection is effective. It is securing the repair of physical defects, and it is correcting unhygienic conditions in over ninety per cent of the cases in which such treatment is desirable. This plan of individual instruction in personal hygiene is improving the physiological efficiency of at least a thousand boys every half year.

Second. Our plan of individual instruction in personal hygiene has met with the support of the parents of practically all our boys. Less than one per cent of the parents refuse treatment. No system can endure without such support.

Third. It is safe to expect that this continued personal relationship extending throughout the high school period and covering the first two collegiate years will develop permanent habits of personal health control in many if not in most of the boys under our supervision.

GENERAL CONCLUSIONS REGARDING MEDICAL INSPECTION

I. The administration of medical inspection in these twenty-five cities is extremely variable and yet there are evidences of certain norms or standards toward which progressive school systems are more or less slowly evolving. The problem of the dissertation is to discover these standards and to develop others, more scientific and sociological, in order that conscious evolution may soundly abridge much of the tedious process of hit and miss, and avoid great individual and social waste. This heterogeneity is shown in a variety of ways, not as an intensive study of any narrow phase but sweepingly in the nature of a broad survey in accordance with the nature of the entire study.

A. The size of the city has little to do with the number of medical inspection agents, although the two largest cities in a number of particulars have almost the same proportionate number of units, doctors and nurses, as the smallest cities.

B. To enable comparison among cities as to number of working units of medical inspection forces, the following factors were added together for a unit: Physicians: average number of hours a day, average number of days a week, average number of weeks in the year, average number of hours yearly actually employed in school medical work, including clerical work, plus the nurse. The quality of the work and the standing of the physicians in their profession, as well as the amount of school time spent in making out records and reports and the amount spent in traveling about from school to school, could not well be determined. Even the number of days annually in which doctors made school visits could not in all cases be learned. The work varies for physicians from an average of a very few hours a year, probably less than fifty, up to two hours a day for each school day in the year (say 350 hours), and some give three hours daily though not so regularly, while the nurses' hours are very close to a standard of a five-and-a-half day week of seven to eight hours daily.

C. The variability is great in the forms of administration and execution of the work. Some cities, like Brockton and Norwood, almost eliminate the physician, while others, like Newark, put the emphasis upon the physicians, although the tendency is strongly toward placing the work more and more in the hands of well trained school nurses. Some cities have the work in the charge of the boards of health, others in charge of boards of education, while others divide the work between the two departments. We have studied cities that have no doctors and others that have no nurses for comparison. Some cities have only inspection systems of a limited kind (for infectious diseases) while others have systems much broader than inspection and including annual physical examinations, cumulative record cards, adequate reporting, and great emphasis upon curative and preventive measures. All-round school clinics are only being agitated as yet.

D. The variability might also be illustrated by the tables of ailments and the very different proportions for any one ailment from zero to sixty or more per hundred children.

II. The *cost* of medical inspection also varies greatly as shown for salaries. The average salary for physicians is about $400 with great variations, while the salaries of nurses is near $75 a month for the school year, and some for the summer, one or two months. Supervisors' salaries range from $800 up to nearly $4,000. Only one board of health has a special supervisor of this work, and he gets the lowest salary. A city may be paying very *small* salaries to its school physicians and yet be paying *more* than a city with a *large* annual salary, when the amounts of time spent during the year in actual school medical work are compared. Other expenditures for medical inspection are as yet very small because of lack of free clinical treatment. The total expenditures and relative expenditures are given in the tables. Adequate systems, as here recommended, will cost from one to four per cent of current expenditures. Scientific reorganization of many existing systems of educational hygiene as a whole need cost little more than is at present spent for a variety of uncorrelated health provisions.

III. *Methods and technique* of inspection are very chaotic, and most reports of the work are so inaccurate and meaningless as to be practically worthless. Little can as yet be said as to what medical inspection is accomplishing for schools. Record systems need greatly to be simplified so efficiency will be promoted, not discouraged. Medical inspection must be correlated with all other phases of educational hygiene: medical inspection, physical education, school sanitation, the teaching of hygiene, and the hygiene of teaching. The work has and should broaden out beyond "inspection" to include annual (physical) examinations and generous curative and preventive measures. Medical *Supervision* of Schools would be a good term to cover all phases, but the writer does not urge its adoption because of the difficulty of getting the name generally used. *Health* Supervision will not do because this describes the scope of the entire department of hygiene, and may be confused with the city health department. The *chief criticism* of methods will be found in the last chapter in the form of a plan for doing the work efficiently and well. We have avoided drawing deadly comparisons and of showing up as much inefficiency as possible. Most cities are willing to make desirable improvements when they see that they are improvements. The final chapter meets this need better than any amount of muck-raking. The tables are largely self-explanatory.

IV. The *nomenclature* and the *classification of school ailments and the various phases of medical inspection* should be widely adopted for promoting reasonable uniformity and greater efficiency. The plan of placing the curative work of the nurse in juxtaposition with the cases found by nurse or physician should be adopted. Some of the essentials for each ailment are as follows:

1. Number of *new* cases (serious, not minor) *found and referred* for treatment by (a) the doctor, and by (b) the nurse.

2. Number of *old* cases *inspected* by (a) the doctor, and (b) the nurse.

3. Number of these cases which were found *negative* by family physicians and agreed as such by the school physician or nurse.

4. After subtracting the negative cases (where the diagnosis has been determined wrong or the child not needing treatment), *the total* number of new and old *remaining*, yet to be followed up until treated and cured.

5. The number of cases (ailments, perhaps several for some children) (a) *treated* by the nurses of school clinic, (b) treated by *other* agencies, (c) *cured.*

6. Number of children *excluded* for the various ailments, counting only one ailment as causing exclusion, number *re-excluded* after presenting themselves at the school, and (c) the number *re-admitted* after illness, exclusion, quarantine, absence of three days or more, and the number admitted for the first time, after the first two weeks of school, i.e., after the routine September room-inspection of all school children.

7. The number of remaining cases (ailments) *not yet* (a) *treated,* (b) *cured.*

The classified list of ailments later recommended as a beginning standard should be placed at the left of the page for the report, weekly, monthly or annually, with the above rubrics as headings. Other significant data are given on the alternative recommended weekly report of the nurse for the work of the doctor and herself. This type of report, when well used will balance.

V. Few of the cities yet have annual medical *examination* of all elementary pupils; and Boston and South Manchester, Conn., were the only ones that had done much in the *high school* field. Medical examination and even inspection reaches but a small proportion of the *total* number of children in the schools, and, although many cures are reported in certain cases, the results in this direction are very meager. *Free school clinics* are recommended.

CHAPTER TEN

PHYSICAL EDUCATION AND OTHER PHASES OF EDUCATIONAL HYGIENE

Following a simple working classification of the various divisions of educational hygiene, we have now completed but one phase or department, that of medical inspection. The short section on Conclusions on Medical Inspection has attempted to bring together in succinct form the chief results and principles arising from our study of the health provisions in the twenty-five cities chosen for this investigation. There remain yet for consideration and study the following divisions: Physical Education, School Sanitation, The Teaching of Hygiene, and the Hygiene of Teaching. In this chapter we can give but briefly the main data and conclusions arrived at in the study of these phases in these cities.

In an investigation of school health provisions, medical inspection naturally comes first, since it, more than anything else, points out those pathological weaknesses of our children which it is the main business of most of the other divisions to prevent and correct. If the work of doctors and nurses shows that a large percentage of the children are poor in health and bodily efficiency, that they are living unhygienically at home and at school, and that they suffer from a whole host of preventable ailments, then we have clearly laid before the whole school system and all the homes their problem and duty relative to health. Medical inspection can do much in the finding of ailments and in their cure. It can by no means cover all the fields of prevention in the form of:

1. Improving the school environment, hygienically, through *school sanitation;*

TABLE XIV.
PHYSICAL EDUCATION.

	Supervisors of Physical Education. Number.	Supervisors of Physical Education. Total salaries.	Teachers of Physical Training and Gymnastics — Elem. Schools. Number.	Elem. Schools. Total salaries.	High Schools. Number.	High Schools. Total salaries.	Playground Teachers and Directors Under Board of Educ. Number.	Playground Total salaries.	Expenditures for playground equipment.	No. schools having baths T-tubs, other, showers.	Daily physical training by reg. school teach's. (class-rooms.)	No. of gymnasiums
1. Summit, N. J.	.	....	1	a$200	...	....	...	...	$200	....	..	..
2. S. Manchester, Conn.	1	$462	..	....	...	....	...	...	....	g4(48)	Yes	1
3. Norwood, Mass.	.	....	..	....	...	....	...	...	25	....	..	..
4. Winchester, Conn.	1	500	..	....	...	....	...	...	....	1	..	1
5. W. Orange, N. J.	1	800	..	....	...	....	...	...	....	1 T	Yes	..
6. Montclair, N. J.	1	1,200	1	900	2	$2,600	13	$600	1,950	2 (4)	Yes	2
7. Meriden, Conn.	.	....	..	....	...	....	...	...	....	....	Yes	..
8. Mt. Vernon, N. Y.	.	....	..	....	...	....	...	...	....	....	..	..
9. Newton, Mass.	1	1,200	..	....	2	$2,950	...	...	....	1	..	1
10. Brockton, Mass.	.	....	..	....	...	....	6	900	....	....	..	1
11. Hoboken, N. J.	.	....	..	....	...	....	...	...	....	....	..	..
12. Schenectady, N. Y.	1	1,000	..	....	2	$2,050	5	d551	200	6S 6T	Yes	1
13. Waterbury, Conn.	.	....	..	....	1	1,300	1	100	....	....	Yes	..
14. Yonkers, N. Y.	.	....	3 2	3,000 1,600	2 .	1,155 1,600	...	...	....	4	..	..
15. N. Bedford, Mass.	.	....	..	....	...	....	c33	2,780	2,000	....	..	..
16. Trenton, N. J.	1	1,000	..	....	...	....	...	...	....	1 (8)	Yes	1
17. Cambridge, Mass.	1	2,200	..	....	1	900	...	...	1,500	1(25)	..	1
18. Lowell, Mass.	.	....	..	....	2	b1,300	...	...	....	1 (7)	..	1
19. N. Haven, Conn.	.	....	..	....	...	....	...	...	....	1(10)	Yes	..
20. Syracuse, N. Y.	1	1,200	..	....	...	....	...	...	....	....	Yes	..
21. Rochester, N. Y.	1	1,600	3	3,300	4	....	16	e575	....	5	Yes	2
22. Providence, R. I.	1	1,600	..	....	...	....	1	300	....	7(28)	..	3
23. Jersey City, N. J.	.	....	..	....	2	3,400	...	...	....	2	Yes	4
24. Newark, N. J.	1 2	2,900 2,500	11 ..	1000-1700 800-1300	8	1200-2500 900-1800	40	...	4,200	Many	Yes	..
25. Boston, Mass.	4	10,956	10	972-1200	22	900-2400	123	...	f25,000	20	Yes	15

a. Folk dancing teacher paid by the teachers. *b.* Military drill master part time. *c.* Eight playgrounds. *d.* One received $200 for 9 weeks, and one donated services. *e.* The expenditures were more than this sum. *f.* Total for physical education supplies. *g.* 12,858 baths taken.

2. Promoting normal physical development, vital resistance, and certain indispensable health habits and ideals, through *physical education;*

3. Giving adequate *health education,* including knowledge, habits, ideals, and appreciations, to the children of the schools and through them to the homes.

4. Managing and teaching the children in the most hygienic manner, making the methods of teaching and the life of the school such as will promote health and happiness, prevent rather than cause physical defects, and given the nation what Dr. Burnham calls a "militia of health" instead of inefficient and unreliable candidates for the sanitarium.*

A. PHYSICAL EDUCATION

A tremendous development of physical education has recently taken place in the form of the *playground movement* and all that it implies, and in the beneficent reaction upon the old, stilted, fatiguing, isolated, and unnatural formal gymnastics inherited from military and autocratic sources. We have shown in a former chapter the tremendous development of this new form of life and activity for children. Like all of the other new health agencies which have recently been crowded into the public schools largely by lay bodies from without, we have here another illustration of a lack of integration with all other health agencies of the schools, of adequate scientific leadership and control, and of proper scientific management and economy. Like many other health provisions, too, the play movement is still quite largely in the private and voluntary stage of development.

The principal phases of this form of physical education found by the writer were:

1. Increased *playground space,* not only by and near the schools, but in parks, vacant lots and other places, and provided by playground commissions, park commissions and many private agencies. The natural play center is,

*See "The Problems of Child Hygiene," by W. H. Burnham, in the 1912 volume of the proceedings of the N. E. A.

of course, at the school, also the best place for community parks.

2. Increased school- and factory-made *play apparatus* in school yards.

3. *Folk dancing* in charge of special instructors employed for this work alone at the schools.

4. *School athletic leagues* in increasing numbers.

5. Emphasis upon more democratic and better directed *athletics* in the high schools.

6. *After school and Saturday direction of play and athletics* of elementary children by school masters.

7. Increased number of *gymnasiums* in the new and old school buildings.

8. Increased number of *physical training teachers* and supervisors.

9. Increased number of evening *recreation centers.*

10. Emphasis on the provision of *skating rinks* for school children in winter.

11. Increased attention to the educational value of play and to its correlation with other motor activities such as industrial work, especially in vacation schools.

12. Increased attention to the direction of the *recess* and other free play periods of school children.

13. Increased number of *summer playgrounds and playground instructors* and directors.

14. Emphasis upon *swimming and bathing* for school children, especially in the summer.

15. Growing use of *play festivals, pageants,* and the like.

It might have been well for us to have carried through rigorously the exact amount of work in all health fields that each city gave during the years studied. Comparisons, however, may be helpful and they may be odious, according to an old saying. We shall be content if we have sketched a method of analyzing the health work of a city, and shown even vaguely how efficiency tests may be applied to them. We studied in some detail the cost, equipment, workers, methods, and results as well as they could be learned of all play agencies, public and private, in the cities chosen. But we cannot give here all the details necessary for discriminating and comparative work. We do give in the following table the main public school physical education expenditures, including, of course, playgrounds summer and winter.

Any examination of this table will show that a considerable number of cities are doing little or nothing in a special way for the physical development of the school children, and that it is only in the largest city, Boston, that we find any extended development of physical development agencies that seem at all adequate either in the old Greek or modern sense. Many cities had no physical training teachers, playground instructors, or even ten- or fifteen-minute periods during the school days for school room calisthenics or games. In some schools and cities there has even been a tendency toward cutting out the good, old-fashioned recess, of so much value in a physical way to the children. It is difficult to state a number of these facts by cities, for occasional schools may be held up as exceptions in almost any city, and any general statement, unless favorable, may be resented.

On the other hand, the general tendency is strongly in the direction of increased health provisions, and a study of the reports of these school systems for the four years from 1909 to 1912, inclusive, has shown some almost radical transformations in this direction. Such statements as the following are significant, in the first report (1910) of Dr. Hermann, then Director of Physical Education at Cambridge: "We have *instituted* both a morning and an afternoon recess (italics mine), which are taken out of doors whenever the weather and the yard conditions are favorable. Without this, only the most active children would get sufficient exercise, and the teachers would not have the opportunity to study their charges while at play."

Particularly marked development along these lines has taken place in New Bedford, Trenton, Cambridge, Newark and Boston.

Beginning again with the whole department of physical education, not including play and playgrounds, we found the following phases, in one or more of the cities, to analyze out and study:

1. General Director of Department of Hygiene, at Boston only (lacking here only the school physicians, to make the department complete).

2. Assistant directors of physical education, three at Boston and two at Newark.

3. Supervisors of physical training or of physical education, largely the former, having only restricted duties, not having general oversight.

4. Elementary school teachers of physical training, play, folk dancing, and all that the subject now includes, number and salaries.

5. High school teachers, or "directors" of gymnasiums, gymnastics, athletics, physical examinations, and the like, number and salaries.

6. Clerical assistants for several of these departments, number and salaries.

7. Military drill masters, assistants, and armorers, number and salaries and the work of the cadets.

8. Number of school gymnasiums, elementary and high schools, including separate drill halls, and the like.

9. Cost of equipment and maintenance for these.

10. Number of gymnasiums used for evening recreation work.

11. Number of swimming pools, shower, and tub baths in elementary and high schools.

12. Number and salaries of bath matrons, and special janitors for baths.

13. Number of outside public or private baths open to school children.

14. Two-minute or ten- or fifteen-minute recreation, play, or calisthenic exercise in the class-room by regular teachers.

15. Salaries of special repair men for gymnasiums.

16. School athletic leagues, their hand-books, their membership and expenditures, private and public.

17. Special coaches in athletics in high or elementary schools.

18. Substitutes in physical education and their management and salaries.

19. Number of lectures to pupils on physical development and general health topics.

20. Employment of sub-masters for directing play after school and Saturdays, Boston.

21. Efforts in the field of medical gymnastics.

Tables when made on the basis of most or all of such divisions, as proved the case for all other phases of educational hygiene, and even for the compact table of school ailments made for medical inspection—such tables were pretty much blank spaces, not only because of the heterogeneity of the work as yet, but also for the reason that many school systems have not yet engaged themselves seriously with the problem of physical education. We are still very far from the Greek ideals of harmonious bodily efficiency. A revolution must gradually be worked in the idea of public education itself before schools, school curricula, and school administration are adjusted to the health and bodily needs of the children of urban civilization. This will be pointed out more particularly under the hygiene of teaching. Much of the promise in the cities here studied lies in the construction of new school buildings, planned, not for disembodied mentalities, nor for rural children getting fairly adequate physical and motor development in the out-of-school life, but for the cooped-up, sedentary, in-door, flat-dwelling children, limited within by the restrictions of apartment-house and school life, and without by the dangers and policemen of the streets. That such a life as is rapidly developing in this country will speedily kill off, through the law of survival, all those unadapted to it and leave a people healthily adjusted to such conditions, may only partially be looked to, for the simple fact of the lower birth-rate in cities and the need of constant replenishment by country folk. Beside this force and possible eugenic control there must be rigorous and radical transforming of the environment and education of the rising generations, especially at the schools. Adequate health education may be expected to *react* upon the health conditions of home and business life, making them in turn more hygienic and healthful.*

PHYSICAL EDUCATION SUPERVISORS

Thirteen of the twenty-five cities could be said to have had at this time supervisors or directors of physical training, but in only three or four could these officials be regarded, perhaps, as directors of physical education. A person who merely teaches physical training in elementary or high schools, and who has no general responsibility for or supervision of all forms of physical education such as mentioned above could hardly be called a director or supervisor of physical education. We should probably put Cambridge, Newark and Boston in this class, and perhaps others. We have listed as supervisors, however, ten others with more limited responsibilities. A person may well be supervisor of physical training or of physical education in the elementary schools or in the high schools alone, but such division leaves an uncorrelated system.*

The salaries at South Manchester and Winchester are for part-time services. The salaries really range from about $1,000 to about $4,000, the director of hygiene at Boston receiving at that time $3,800, and the assistants about $2,400 each. At Yonkers, no one physical training teacher seemed to be supervisor and no report on physical

*I do not wish to suggest here that country children are not in need of radically improved hygienic conditions. In making this study the writer traveled over a large portion of New England, New York and New Jersey in street cars, thus coming close once more with country folk; and the most vivid impression of the people met was that of their low physical efficiency. Of course urban and western selection has taken off most of the vigorous, physically superior individuals, as the wars of Europe have cut off its stronger and abler types, but after subtracting this influence we must admit the possibility of raising considerably the hygienic conditions of country life. See also Gillette's "Constructive Rural Sociology."

*See the excellent chapters in Johnston's High School Education (Scribner's) on "Physiology and Hygiene," and "Sex Pedagogy in the High School" and other chapters in Vol. II.

education appears in the 1910-11 annual report. Seven cities, apparently, had no special teachers in this field. In Rochester the supervisor is employed for the work of directing the summer playgrounds, and this is also true of Boston. There, the services of the director are for eleven months. In Boston and Newark, all officials in this field of work are on a salary schedule, with minimum and maximum salaries. This is highly desirable, as is also, for the most part, the twelve payments a year plan.

ELEMENTARY SCHOOL TEACHERS OF PHYSICAL TRAINING

After subtracting the supervisors, so-called, we have but few special teachers of this subject left for the elementary schools. It is also a problem whether many or most of these cities *need* many such teachers. In another chapter the author has evolved a plan by which a physician with knowledge and experience in physical education may be employed by a city or several small cities or a country township or county, and given the directorship of all five phases of educational hygiene, thus making possible the elimination of much of the present expenditures for poorly trained medical examiners and physical training supervisors. The present physical directors in the high school gymnasiums should be retained, and, if need be, one or more physical training teachers for the elementary schools. If competent nurses are employed for about each 1500 to 2000 school children they may be given also the present work of the attendance officers; no general directors of summer playgrounds need be employed, except in cities large enough to have assistant directors; fewer part-time physicians need be employed, as suggested; and in all, for a great many cities, a re-organized and efficient system, correlating all health agencies, may be obtained, even when paying the general physician-director $3,000 or more, for little more annual expense than under the present poorly directed and un-organized plans of management. The writer knows of twenty-five available and qualified men for such positions now. More young physicians will take the training necessary when a demand is evidenced. We probably need more Doctors of Public Health (D. P. H.) rather than so many Doctors of Philosophy (Ph.D.). The possible saved expenditures in this direction for these cities should be subtracted from the estimates of needed hygiene officials given in table XII.

Besides the ten or more physical training teachers for the elementary schools, Boston had a most interesting experiment in the employment of 60 male teachers of the schools (sub-masters) to go out with the boys to the parks and playgrounds after school and Saturday mornings to direct them in their sports. Each teacher is paid $1.25 extra for each period, six a week, and the whole scheme has seemed to be eminently successful.

Instead of giving the amounts expended for such teachers and high school directors in the two largest cities, we give only the minimum and maximum salaries, the teachers being at different points in the schedules as was the case of the 35, and now 41 or more, nurses in Boston, and the eight in Newark. Wherever two or more teachers or directors are recorded their combined, and not their separate, salaries are given. Thus the two assistant supervisors at Newark received $1,100 and $1,400 respectively, or $2,500 together (maximum, $2,000); and the three teachers at Rochester received a combined sum of $3,300. This would also apply to Yonkers, and also to the playground teachers in several places.

Like the school nurses, the physical training teachers are practically all graduates of special schools or departments for such work. We found only one nurse who had only the qualifications of a regular grade teacher (at Lowell) and we found only one teacher of physical training who had "just picked it up." It is easy today to get superior training in this field, but not in the field of medical inspection, and there are still no schools for the education of directors of hygiene which will abridge the medical course, leaving out much in such special fields as obstetrics and adult treatment as will not function and putting in much left out by the regular medical course. We are not aware that the University of Wisconsin has provided preparation for this service in its new health department. Teachers and directors can now obtain a good library and can get a good summer course on the medical aspects of their work.

HIGH SCHOOL TEACHERS OF PHYSICAL TRAINING

Eleven or more of the twenty-five cities had one or more teachers of physical training in the high schools.* Most of the newer high schools were being supplied with gymnasiums, as well as many of the new elementary schools, and generally we found at each high school thus equipped a man for the boys and a woman for the girls conducting the department. In some cases, as at Montclair and Lowell, outside buildings have been rented or purchased for such provisions. The $500 salary at Lowell was for the part-time services of a drill master for the boy cadets. In this city, Boston, Brockton, and a few other cities, more or less attention is being paid to this form of health development, largely for high school students. It is much more military in character than the Boy Scouts scheme, and probably not so valuable. The cadets in Brockton, however, take trips somewhat as do the Boy Scouts. Both have uniforms, but with a difference. Of one of these successful cadet organizations Professor Wm. H. Burnham, the dean of educational hygienists in this country, has this to say:

"A few weeks ago it was my privilege to witness the parade of the high school cadets of Boston, a parade of two or three thousand school boys. It was an excellent exhibition of the results of careful drill and organization. The cadets did credit to themselves and to their military instructors. But as I observed them as they marched, I noticed how many were sallow in countenance, anemic, or flat chested, or mouth breathers, or apparently suffering

*See Gulick's study of the "Status of Physical Education in 90 Public Normal Schools and 2,392 Public High Schools in the United States." Fourth National School Hygiene Congress.

from some physical disorder or defect or bad condition; and how few had the ruddy glow and the general aspect of health that the adolescent should exhibit. These were, however, in a certain sense, the pick of the pupils in the public schools.

"If this is the price that must be paid for education, it is no wonder that parents are dissatisfied and that they ask whether the reward is worth the sacrifice. What man of sense would bargain vigorous health, normal development, and a few motor accomplishments like those of the Boy Scouts for a little conventional book-knowledge and anemia and ill-health and mal-development?"

He furthermore recommends* that drill in health habits be substituted in part for the special drill in military tactics, and the development, not of a kind of police force, but of *"a militia of health trained to fight the conditions of disease by the methods of modern science."*

This is but one step in the complete socialization of the whole physical education department. With scientific and medically trained people in charge, we may expect studies to be made of the health needs and health problems of the students and the people of the community in order to make education hit the mark. What physical education seems to need is a great deal more of scientific and socialized intelligence, rather than special motor accomplishments.

We made little or no study of athletics and athletic coaches. The football, basketball, track meets, and all the various forms of outdoor and indoor competitions furnish specially acute problems which take special investigation and time in each city. Most of the progressive departments are now working for or have attained, athletic fields, stadiums, and all the paraphernalia of the college. With proper re-organization of the high school curricula, throwing out the immense quantities of deadwood that have accumulated for ages of formal discipline theories, and with the introduction of thoroughly essential educational activi-

*See 1912 volume of the N. E. A., page 1102.

ties, we may expect these health fields and equipment to provide thoroughly democratic and general physical and social development of the old Greek type and better.

MEDICAL EXAMINATIONS AND EMERGENCY TREATMENT

In all first-class high school departments of this kind, as in normal schools and colleges, physical examinations and emergency diagnosis and treatment are attempted. The sad fact, however, is that most high school gymnastic directors are not properly qualified for such work. In asking them for their views on medical inspection, they nearly always request that the physicians make their heart and lung examinations for those going into athletics because they "do not feel properly qualified"; they do not have a medically trained eye always to notice fairly obvious indexes of physical defects and other ailments; and so, instead of being the health guardians of the high school, able to discover all health impediments to education and to act as general medical and sanitary inspectors of the school, we have them occupying a little isolated niche. Such a lack of medical qualifications, is, of course, very expensive to the school system that tries to do the best for the hygiene of the school. The male physician-director of the *normal* school can adequately examine his pupils, with their clothing removed, for heart, lung and other examinations, and the woman physician director can also adequately examine and inspect, when necessary, her pupils. Trouble arises when this is attempted by outside or part-time physicians, and the only economical method in the long run will be for these two or more teachers who meet all the pupils perhaps every week, to be physicians, or have special medical knowledge, and do the work of medical examination and inspection. Many illustrations from life could be given of the even fatal results coming from having under-educated health-development teachers in charge of this vitally essential work.

Boston gets around this difficulty partly by having qualified persons in the high schools, partly by having special physicians employed for medical examinations in the high schools, and partly by having a director of hygiene who is also a physician. The last is a part of the essentials of the plan proposed by the writer in the next chapter. Let us not forget that under the proper kind of a director of hygiene these high school directors may be *taught* to do this work satisfactorily in many cases. We have instances where regular teachers, working with school physicians, have acquired rare powers in this direction.

GYMNASIUM AND GYMNASIUM BATHS

At least sixteen or seventeen of the cities had baths in one or more of the schools, elementary and high, but mostly the latter, and both tubs and showers, but mostly the latter. South Manchester each year gives a good report of the school baths, and we find that at one school during 1910-11 as many as 12,858 baths were taken. In all modern schools where there are gymnasiums or where there are equipped playgrounds adjacent, we found one or more shower baths for both boys and girls.* We found that about the same number of cities had gymnasiums as had baths, although they are not co-incident. These are relatively modern additions to schools and school boards have not yet been made to realize the truth for school children, many without bath tubs or parents with bath ideals at home, that "cleanliness is next to Godliness."

In a growing number of cities, through the use of bath rooms in schools for summer playgrounds and for evening recreation centers, there is a tendency for public school baths to become general public baths, and there is little reason why this should not become universal, just as much as the tendency for the school to have within it a branch of the public library or any other of the many agencies which are being developed in response to the peoples' needs. Too often our schools are looked upon as absolute, un-

*For those interested in the various types of equipment for these health features the reader is referred to the excellent reports and advertisements in the *School Board Journal,* published at Milwaukee.

changing and unchangeable institutions, instead of institutions purchased by the hard toil of the many, and supplementary institutions, now idle much of the time, for meeting the peoples' needs and perplexing life problems. We need scientific sociologists who can discover the needs, and we must have teachers and leaders who can best help the people to meet them through this single public neighborhood institution.

The many other phases of physical training we shall not here discuss. They are sufficient in all for a much needed book. A recent valuable one along this line but more for adults is "Exercise in Education and Medicine," by Professor R. Tait McKenzie, of the University of Pennsylvania. We should have liked to take space for discussing the work of medical gymnastics along the line of mouth breathing exercises, special exercises for spinal curvature cases, and the like. Let us turn our attention, however, briefly to the before-mentioned work of:

PLAYGROUNDS AND PLAYGROUND TEACHERS

The following interesting and relatively statistical phases of this new movement were given as much study as possibilities of time and available data permitted:

1. Number of school-yard playgrounds fitted up with play apparatus and the number supervised, summer or winter.

2. Number of these playgrounds fitted up or supervised by outside agencies.

3. Number of playgrounds elsewhere provided by the board of education.

4. Number of other public supported playgrounds, swimming pools, or beaches.

5. Number of privately supported playgrounds, other than those at the schools.

6. Expenditures for salaries of playground directors, teachers, caretakers, etc., by the board of education.

7. Expenditures for playground apparatus by the board of education.

8. Expenditures for enlarging old or purchasing new playgrounds, grading, and the like.

9. Expenditures for playground supplies other than apparatus.

10. Expenditures for the rent of playground sites.

11. Expenditures for tents, shelters, toilet conveniences, baths, etc.

12. Number, qualifications, and salaries of playground directors or supervisors.

13. Number of assistant directors, salaries, etc.

14. Number of playground instructors, salaries, etc.

15. Number of weeks employed, and daily and weekly time schedules.

16. Number of instructors for each playground and how selected.

17. The games, contests, sports, and problems of the work. The writer was once a public playground instructor and realized some of these problems in advance.

18. Number of regular class-room teachers who by any inducement, such as the $1.25 at Boston, could be gotten out upon the playgrounds with their children to be young again and play. "Come let us *play* with our children."

19. Total expenditures for public school playgrounds.

20. The methods by which the various private bodies realized their aims in getting playgrounds started in the schools.

These and a number of other problems were first obtained in note-book, and other original data form, and then placed on a statistical table for the twenty-five cities. But it was so much a table of gaps, that it could well be used for study only, and not for printing. A few of the many items necessary for adequate knowledge and careful investigation appear in the Physical Education table.

New Bedford and Boston stand out in the writer's mind and data as being typically progressive along these lines, though several other cities such as Rochester and Newark might also have been named. The data were so hard to get that in many cases we have very inadequate facts or none to present. In other cases we have been able to get all the data we desired. This seemed especially true of New Bedford, where a good deal of scientific management seems to pervade the school administration.

Very few cities outside of Boston have been doing much with the directed and organized play during the day except in summer. It is difficult to get teachers for their own or the children's good to go out and play at any time, without pay. In most cases they need special training for such work. The many children who come to school, and should come, as early as eight o'clock in the morning and who stay, and should stay (because of bad home or play conditions elsewhere) till four or five in the evening, should have guidance, protection and educative care. The increased health efficiency of the teachers and the decrease of teacher-absence through illness, now so great a source of waste in all cities, might easily be sufficient to warrant a city for mere economy to employ, as does Boston, these out-of-school play teachers. Walks, trips, excursions, "tramps," and the like, on Saturdays, have all been tried by the writer as a school principal and were found successful, and might easily be added to the above program. The school system of Gary, Indiana, is working out much in the line of the whole day and year school, that many educators have long experienced as a real need of childhood.

A remarkable thing was the number of *privately* supported playgrounds. This has recently been a very popular form of private philanthropy, and should be heartily encouraged and guided. But the goal of it all must be, of course, adequately organized public management of such agencies. It is remarkable how much the leadership of the superintendent of schools stands out in all these fields of enterprise. Some are excellent, old-time scholars, or "hale fellows well met," but they don't see the need or get the results which a modern community may rightfully expect.

The summer playgrounds are frequently about eight weeks in duration and are often intimately united with the vacation schools, as they should be. The salaries range from fifty to two hundred dollars a month. The tremendous development of literature in this field makes unnecessary detailed statements of costs or methods. The National Playground Association of America with its proceedings, and its magazine, the *Playground,* the books of Bancroft, Mero, Johnson, Perry, Leland, Lee, and many others; the pamphlets, slides, free information, etc., of the Child Hygiene Division of the Russell Sage Foundation, and many other expert agencies at the command of public school systems desiring assistance have made unnecessary here extended treatment. It may be well briefly to describe the administration in the New Bedford public school playgrounds.

A skilled playground director was brought from Toledo, Ohio, and the following force employed for six weeks on eight playgrounds in the summer:

1 supervisor at $200.		
8 directors, one for each playground (men)..	$600—	$75 a term.
8 first assistants (women)..................	480—	60 a term.
8 second assistants (women)................	750—	75 a term.
8 men assistants	800—	100 a term.
8 caretakers, or janitors....................	240—	30 a term extra.

The plan was to have four persons on each playground. There were swings, sand boxes, large combination apparatus, teeters, slides, merry-go-rounds, rest rooms fitted up with interesting books for the children by the public library and the schools, use of school toilets and baths, trees and benches for the parents and little mothers, and first-class conditions, generally. At night electric arc lights illuminated the grounds and directed play was still carried on, especially basketball and athletic games and "stunts" by the older boys and young working men. I saw no evidence of home-made, or manual-training-made apparatus, which I think should be encouraged and which I have found school boys even below the eighth grade quite able to construct when properly guided, from getting the materials from the mills to digging the holes and painting the constructions bottle-green. All the apparatus was very finely constructed, durable and expensive. It seems that where there is time, home blacksmiths could make most of the apparatus of playgrounds for which present companies are charging almost exorbitant and seemingly trust prices. The boys should in every case possible be given, also, a chance to show their hand.

Having reached our space limit for the various forms of Physical Education, let us take a brief survey of one of the three remaining divisions of educational hygiene in these cities.

B. School Sanitation.

Recent surveys of the hygienic aspects of the school environment of our children by the United States Government and other agencies have shown that they are in general far below the health ideals, knowledge and standards of the present day. One writer has declared that it would be a hygienic providence if half of the vilely constructed and situated school-houses of this country were to burn down, in order to make possible school environments suited to present-day needs and conditions. The writer visited one or more, and as many as ten, school buildings in each city visited, excepting the fifteen not used for this study. Some of the new schools are very close to the best hygienic ideals, and their numbers are fortunately growing. We should have state laws requiring the submission of all plans for school buildings to an expert, up-to-date school architect in the state education department, to help cities avoid the employment of so-called architects who have never planned anything much more elaborate than a sawmill, or common warehouse, and these only by copying imitatively some long-existing structure.

Our chief method was to learn about some of the more administrative aspects of the school sanitation problem. Some of the features investigated more or less closely were:

1. The number, kind, cost and efficiency of the various types of sanitary drinking fountains installed.

2. The kinds, number, cost and efficiency of the vacuum cleaning plants in use, discarded or proposed.

3. The number and kinds of fan systems of ventilation in use, the attempts to humidify the air, the use of humidiometers and regulators of temperature and moisture.

4. The new types of school seats which make cleaning easy, and especially the use of vacuum cleaners.

5. The construction, location and arrangement of open-window rooms in schools.

6. The amounts, kinds, efficiency and cost of the floor oils used.

7. The amounts, kinds, efficiency and cost of dust-absorbing compounds used in sweeping, as well as the use or non-use of the feather dust-raiser.

8. Paper or cloth towels, number, cost, kinds, and efficiency.

9. Amounts, kinds and use of disinfectants for schools.

10. The use of individual drinkings cups, and how cared for.

11. Experiments and investigations in the field of school sanitation. "Re-circulation" has not yet reached the schools.

12. The general hygienic character of the buildings visited, including fire-proofing, and all the various modern improvements for making cleanliness easily possible.

13. General management of the cleaning and janitorial service, and how paid, feudally or individually.

A large amount of data was collected on these phases but the matter makes but poor statistical tables because of the aforesaid lacunæ.

There was some remodeling of the heating, ventilating, toilet, and other sanitary provisions in old schools of a number of systems, Syracuse and New Bedford being especially busy along this line, it seemed.

Sanitary drinking fountains were found in practically all school systems, but in many, these were only samples sent in by various companies in hopes of an order. South Manchester, Norwood, Winchester, Montclair, Hoboken, New Bedford, Cambridge, and Boston had them in almost every, or in every school. The Keith bubbler seemed most used and satisfactory, although a host of other types were being tried out. The writer saw fifteen or sixteen that had been placed over the watering troughs of the boys' play-room in one school in Jersey City. Only one or two were still "in the ring," as the boys said. One or two had been taken off because of the breaking of children's teeth on them in the jostling crowd. The following requirements for such fountains seem to stand out:

1. They must be very strong and durable, not getting out of repair, nor weak enough in any part to be screwed or pulled off or apart.

2. They must provide cool water, not warm, in a sanitary manner, with no part touching the pupil, if possible, that is not immediately washed off. A small leak, or a plan for turning the water on and off by the janitor, or the possibility of running out a large amount of water quickly "to get down to the *cool*" is necessary.

3. They must be in batteries and over troughs to provide for many children, without making a flood on the floor.

4. They must be safe, so no child may be cut, get his teeth broken, or anything of the kind even when pushed about. Good janitor service and training are necessary here also.

5. They must not be very wasteful of water, although considerable loss is here expected.

6. They must be placed on every floor, or one in every room, as well as in the basement play-rooms. Plenty of pure water is desirable for children.

7. They must be relatively inexpensive, although certain cities bought very costly porcelain standards and fountains at great cost.

8. It should be made impossible for one child to squirt water over an entire group or hall.

9. If placed out of doors it must not rust and it must not freeze.

10. It should be self-closing; and the bubble or fountain

of water should not rise at any time more than one and a half inches.*

The prices range around three to six dollars apiece, although the porcelain standard one, such as used in Montclair in a new school, costs about fifty dollars apiece. New Bedford paid $1,093 for 117, connected and in place, I believe.

VACUUM CLEANING PLANTS

Very few cities were using vacuum cleaning plants in the schools. South Manchester was the only city using them in all schools, and the 1909 report of the superintendent speaks very highly of them. I saw the method of using them in the high school and agreed that they probably were very desirable. The newer schools in Newark are utilizing them. Montclair has a building piped for their use but has not yet put in the apparatus. The piping can be easily done in new but not in old buildings, so putting them in is wise foresight, it seems. Waterbury was tearing up the high school to get pipes in when I was there. Boston had three such plants, two having been installed in the year. Rochester had put a plant in several years before (1908) in a grammar school, but it had proved useless because of the faults of the apparatus perhaps, but more because the head janitor was paid a lump sum, and the women helpers he employed could not manage the apparatus. "It was more bother than it was worth" to them. There are easier and dustier ways. Careful investigation and experiment, careful selection of janitors on other than the feudal system, probably, careful training of janitors in the use of the apparatus, carefully constructed floor (we need composition floors that are effective), and careful selection of fewer-legged desks and seats are all necessary for the best use of vacuum cleaners.

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*The *School Board Journal* above referred to has many advertisements and cuts of various makes, and any school system can easily get the chance to try out any number desired. Such experimentation is desirable before purchasing.

SANITARY SCHOOL DESKS AND SEATS

Real educational school desks will probably be, as in the University of Chicago model school, work benches or combination working desks, movable, adjustable and with movable seats. Such desks are not used. The usual type has four or more legs close to the floor and screwed down. This is the child's stationary stall, for silent, sedentary, bookish work. It does not meet the needs of the all-around school life. However, there are school desks and seats that have all the disadvantages of being stationary and fixed, and without some of the "new-fangled notions" of combination work-bench-desk, but having, alas, the quality of being adjustable to the child, that can be swept under and kept in sanitary condition. I refer to the oval base, single-pedestal combined seat and desk invented by a Boston janitor and improved upon and sold in the market by a well-known seating firm. Here is only *one* pedestal for each child in the room instead of *four*. When poorly put down they become "wobbly," and the boy in front can spoil the writing of the boy behind, but this insecurity is unnecessary. The Moulthrop movable school chair is also becoming popular.

Adjustable desks were used in only a part of the cities and in only a part of the schools. A city may reply to a questionnaire that it uses adjustable desks and have only a few in use. This is a weakness of the investigation reported in Chapter Two.

In Boston, the School House Commission has always been in the lead of most cities in problems of school architecture and sanitation. It has done most in the way of devising the proper kinds of windows in south-exposed rooms, for open-air rooms. It also sent a deputation to Chicago to study open-window and open-air schools there, "with little profit." It has also done most in the study of humidifying the school atmosphere, and the lack of agreement among experts in ventilation consulted has almost brought matters to a standstill until the problem is less obscure. There are, however, examples of humidifiers and regulators that seem to work to great advantage, as at the Horace Mann School, Teachers College, Columbia University. A steam pan is used, and several barrels of water are sometimes used in a day in keeping up a 55 per cent saturation, and a 65 degree class-room temperature, all automatically regulated by wet bulb and dry bulb humidiometers by the Johnson Service Company.

FLOOR OILS

Floor oils are quite commonly used, and are bought for from ten cents to more than a dollar a gallon. Experiments and analyses at Rochester and try-outs at West Orange seemed to show that there was little difference between oil of the two prices. A city could get about the same oil for the price it wished to pay. We very much need adequate experimental testing of many more or all of the various kinds of school supplies and equipment. We need better *use* and test of what we get, as well as "more money for public schools."

Oil carefully put on, left to dry, and then wiped off with cloths, during a two or more days' vacation has in a more or less scientific manner been found very desirable in keeping schools clean, and little complaint from women teachers about their skirts have arisen. In the writer's own school the women teachers voted to have oiling stopped, but after an experiment of three or four weeks voted to have it renewed. The matter has been tested out in various ways. We need a careful experimental and adequately controlled test of the whole method. Some insist on bare floors, others on oiled floors. Differences in floors and janitors count, but the matter can be comparatively and experimentally proved.

DUST ABSORBING COMPOUNDS AND SPRAYS

It is remarkable what a variety of products are used in this field. It is encouraging to see something of the kind used, but again we have little proof of the value of any one kind over others. About twenty of the cities used damp sawdust or one or more of the various kinds of no-dustos, dustalines, no-more-dust, sprays (Rihac), etc. What must be had is the experimental testing of these expensive theories. Perhaps damp sawdust is sufficiently efficient. Perhaps it would be cheaper to put in vacuum cleaners. Perhaps oil brushes are better. Who knows?

PAPER VS. CLOTH TOWELS

Paper towels seem easily to be winning out over the old common cloth towel. Many cities were trying them, and some cities, like New Bedford, Montclair and others, had definitely adopted them for all children. They are now so cheap, so thoroughly individual, so sanitary, and so effective, if well chosen through experimental testing, that there is no longer any excuse for the old, indecent, filthy and generally de-educating lack of proper sanitary necessities yet so common. We teach and preach to our children in the classrooms about the dangers of *carriers* and Typhoid Marys, and then fail to provide conditions which will make possible the acquisition of anti-Typhoid Mary habits in our class and toilet rooms. Every child should have *warm* water with which to wash his hands, liquid soap for the inevitable grime of the real playground and real boy, good absorbent paper towels, satisfactory arrangements for plenty of good drinking water obtained without danger to life and limb; clean, well-equipped and sufficient toilet facilities, a drying and warming place for himself and his clothes when he comes wet and cold to school (perhaps without breakfast, or one of only coffee and bread), a place to clean his shoes and insistence on it, a place to hang his clothes that is warm and dry and supplied with hooks that keep the clothing and possible contagion far apart instead of huddled together for the benefit of scarlet fever, diphtheria and very much larger germs. *The only kind of health knowledge and hygiene for our pupils is the kind that will eventuate in adequate health habits,* and how many schools even fairly meet the simple essential sanitary standards above named? Entirely too few.

We must close the report of this division. Better sanitation is approaching slowly, and for its slowness there is a reason, convincing to the writer, and to be given at the end of the chapter.

C. The Teaching of Hygiene.

We meet the same situation in the field of the teaching of hygiene, a form of knowledge, habits and ideals much more important in the modern world than probably three or four entire subjects now tremendously emphasized "for their formal disciplinary value" in our high schools and probably one or two in our elementary schools. And yet the subject is a tail-end subject, little emphasized, and furnished with poor textbooks for the most part and very frequently with poor teachers in the grades or high school. Colleges do not generally give credit for, nor demand a knowledge of, this vitally essential subject of health and how to get and maintain it, much to their disparagement, and consequently we find many schools almost entirely neglecting it.* And yet the cadets march by, with sunken chest and defective eye, all but those who have dropped by the wayside through death and illness; and the medical inspectors continue to report their ailments by the thousands. The problems of the people are the problems of education. Health is a *prime* problem, and health knowledge measuring up to our needs today is one of those alphabetic concepts which every child must have whether he ever sees a grammar or an algebra or a Cæsar or a geometry or a moderr foreign language in his life.

Health teaching is in these cities evidently "seriously defective," in the words of the New York School Inquiry Report, and most educators today are realizing it and gradually beginning to introduce pragmatic changes.

I learned in most cities how much time was given to the subject of hygiene in all grades, elementary and high schools, and the texts used. We shall not repeat here the names of many of the texts. In the older days of logic, all

*See Johnston's High School Education, volume one.

our subjects began with the *anatomy* of the subject, the dry-bones, so to speak, the formal grammar, the letters, the parts of a letter in penmanship, celestial mechanics in geography, the bones of arithmetic, etc. One of the old books on "Anatomy and Physiology for Children," or some such title actually started out with a chapter entitled, "Dry Bones," and all the 206 with their good points were to be learned by heart, with never a mention of how to live healthily and happily in this world. Then came the *physiology* period, when we learned some anatomy and much of the chemistry of digestion and respiration, etc. Today the subject is at last becoming socialized and changed from a logical, abstract science to a vitally essential scientific art, ministering to the health needs of our people. Some of these older texts are still being used in the cities visited, and in very few of the cities in elementary or high school is the subject given the time and texts which its known value warrants and demands.

The Ritchie Hygiene series and that by Gulick and Jewett seem at present to be in advance of all others. We found them used in but ten cities. In most of the other cities where I had an opportunity to talk with the superintendent on the matter of school hygiene texts, I found books from one of these two suggested series either ordered, about to be ordered, or actually being experimentally tried out in a few rooms. Probably a search of the present book lists of these cities would show better supplies of more modern texts. One subject of great importance but little taught is that of *industrial* hygiene. Another is sex hygiene.

Teachers are not adequately trained in this subject in most normal schools and consequently have not the interest in, or such a knowledge of, the subject as is desirable. Lacking health education, and in their comparative isolation from the problems of life, we find that they cannot clearly see "what knowledge is of most worth" to their pupils. The modern world is becoming aware of its health

NOTE.—Colton's new book on "The People's Health" by Macmillans is a very valuable contribution to upper-grade texts in hygiene.

heritage and health knowledge now possessed by but a few is rapidly coming to be democratized, so we may expect soon the most rapid changes toward meeting the real needs of real life. Good textbooks are indispensable for the best results for American teachers in general, and their selection, as well as the time allotment, are matters for close study.

D. The Hygiene of Teaching.

This division of educational hygiene is usually called "the hygiene of instruction," but instruction is only a part of the teacher's work and the life of the school. The French are wont to contrast instruction and education. The German or French teacher instructs all his classes all day long. The American teacher gives time for individual study, self-help, and individual guidance, for *teaching* in the best sense, and so we use the term, the Hygiene of Teaching.

A teacher may teach hygiene for such long periods or in so dry and dismal a way as to over-fatigue and depress her pupils. She may teach splendidly the subject of tuberculosis in a school-room with all windows tightly closed and the air so thick and vile that little lungs easily become susceptible to the germs she teaches the children to dread. She would have taught better had she opened her windows in a proper manner. Again she may be teaching quite effectively, from the intellectual side, the hygiene of vision, and yet the print of the books she has placed in her pupils' hands may be so atrocious that most children suffer from eyestrain after the study period; or again her curtains may be so arranged that with well printed books and good teaching, she may be injuring her pupils' eyes by bad lighting, while discussing the danger. All these are mistakes in the hygiene of teaching and there are multitudes more which the unhygienically trained teacher will make continually in any few days of time.

Other topics in this field, but not studied in the investigation because of the room-to-room character of the work, are: fatigue, school program, one session or two sessions, recesses or no recesses, rest periods, the type of books, the adjustment of the daily surroundings of pupils to their bodily needs, the health results of marks and examinations, the teacher's responsibility for the increase of defects of vision, for choreic, anemic and debilitated children, the development of healthful habits and interests, and ways of study and doing work; in general, the most harmonious guidance of the school life of the pupil and his fellows, in order that there may be a real hygiene of living, a hygiene that "will make growth more perfect, life more vigorous, decay less rapid, death more remote."

CONCLUSIONS

In this chapter we have taken a rapid survey of the last four divisions of educational hygiene as practiced in these cities, and as they should have been practiced. We have found them in a transitional stage and changing in a few years from a more static, isolated attitude toward the problems of school health, to a more socialized, scientific and democratic attitude. Some of the cities will probably be little further advanced in the next decade, but the most of them will before long undoubtably make most of "the things hoped for" an actual realization.

The principal drawback, as I see it, is neither the lack of money nor the backwardness of the people and the superintendent, but in the gap existing in practically each school system that should be filled by a person specially intelligent, responsive and able in health matters. The ordinary superintendent probably does not give a large fraction of one per cent of his time and energy to the problems of educational hygiene. He and his supervisors and his teachers are otherwise engaged. The *intellectual* aspects of life are those which absorb his and teachers' energies. He appreciates somewhat the health needs but he does not, or can not, take time for them. The solution of the health problem in the schools will come, as we have seen all along throughout the book, only in the appointment of a thoroughly qualified man, educated in medicine and school hygiene, and given the entire management and responsibility for the health aspects of education. Only then, I believe, will health become a reality in our schools, and educational hygiene now in its infancy become a scientific art.

The following chapter brings all the suggestions of the book together in the form of a rather detailed and practical plan for reaching this much-to-be-desired goal, in the adequate administration and reorganization of all the divisions of educational hygiene.

HEALTH EFFICIENCY THROUGH NORMAL EDUCATION

With the increasing socialization of education we may look forward toward a more normal mental and physical life for school children. The older methods of sentencing growing children for many years to sedentary book-reading in stationary seats are beginning to pass away. Children are no longer looked upon by the best teachers and administrators as mere disembodied mentalities, but school life is becoming an all-round life largely consisting of useful, socializing and energizing motor work and play. The school grounds are becoming community parks and recreation centers taking the place of the village green of the olden times; the school building is being transformed into a house of childhood adequately adapted to the real nature of children and the needs of society; and the old Greek spirit of all-round joyous efficiency is coming by a new birth again into its own.. We need many more experimental schools that, like Tuskeegee, Abbotsholme, Inter-laken, and the various consolidated farm schools, will lead the way into this broader and less artificial education. Health efficiency through normal living is an actual possibility.

PART THREE

THE ADMINISTRATION OF MEDICAL INSPECTION

(Part three may also be had in separate pamphlet form for the use of teachers, nurses, doctors, etc. The blank forms herein described may be purchased in quantities from the publishers, Teachers College, Columbia University, Publication Department, New York City.)

ENLARGING SCOPE OF THE SCHOOL

"The complete pedagogy of the future when it comes will be larger than it has yet entered into the heart of any man to conceive. Thus the present situation should appeal to the best young men as education has never before appealed. All the four or five score of child-helping-welfare agencies must and will be correlated with the school and directed from one central bureau, so that each child can be placed just where in the whole system it will get the most good. Each, too, will not only be inspected medically and morally, but studied for vocational aptitudes."— G. Stanley Hall, in Introduction to "Educational Problems."

CHAPTER ELEVEN

THE ADMINISTRATION OF MEDICAL INSPECTION

A TENTATIVE STANDARD PLAN

I. GENERAL ORGANIZATION

A. Each school system able to afford it, and few cannot, should have an organized Department of Hygiene, with a Supervisor of Hygiene, correlative with other supervisory departments in the schools. It should be called the Department of *Hygiene* to avoid confusion with the department of *health* of the city. It need not be entitled the "Department of *School* Hygiene" for the same reason that the department of drawing is not called the department of *school* drawing. Neither need it be called the "Department of Hygiene *and Physical Training,*" nor any other such combination. The word Hygiene is as broad as Health and may be used to cover all health agencies of the public schools, namely:

1. Medical Inspection.
2. Physical Education.
3. School Sanitation.
4. The Teaching of Hygiene.
5. The Hygiene of Teaching.

The *function* of such a department is to coordinate and make efficient through organization, inspiration, and supervision all the heterogeneous agencies for the promotion of the health and normal physical development of the school children.

SCOPE

A large number of the more or less neglected problems of school health and national vitality would thus come within the scope of this department, among which may be

THE DIVISIONS OF EDUCATIONAL HYGIENE

Supervisor of Hygiene

MEDICAL SUPERVISION

- NURSES AND DOCTORS.
- INSPECTIONS AND ANNUAL EXAMINATIONS
- SCHOOL CLINICS.
- HEALTH CENSUS.
- DISCOVERING HEALTH NEEDS.
- CO-OPERATING WITH BOARDS OF HEALTH AND PRIVATE ORGANIZATIONS.
- OPEN AIR SCHOOLS.
- LIMITING DOCTORS TO EXAMINATIONS, SUPERVISION OF NURSES AND WORK IN CLINICS.
- PSYCHOLOGISTS, OCULISTS, SURGEONS, DENTISTS, PHYSICIANS.
- SUPERVISION OF SCHOOL FEEDING.
- SCIENTIFIC STUDIES OF PREVENTION AND CAUSE OF DISEASE.
- CAREFUL RECORDS EMPHASIZING SERIOUS AILMENTS FOUND AND CURED.
- TRAINING SCHOOL NURSES FOR ALL INSPECTION AND EXAMINATION.
- NURSES AS ATTENDANCE OFFICERS.

SCHOOL SANITATION

- SCHOOL SITES AND ARCHITECTURE.
- VENTILATION.
- LIGHTING.
- HEATING.
- DRINKING WATER AND FOUNTAINS.
- SCHOOL CLEANING.
- VACUUM CLEANERS.
- SCHOOL BATHS.
- HYGIENIC TOILET FACILITIES.
- SCHOOL SEATS AND DESKS.
- DECORATION.
- THE STANDARD SCHOOL ROOM.
- FIRE-PROOF CONSTRUCTION.
- HEALTH, REST, AND EMERGENCY ROOMS.
- PLAYROOMS AND ROOF PLAYGROUNDS.
- OPEN WINDOW ROOMS.
- SUPERVISION OF JANITORS.
- HYGIENIC CLOAK ROOMS.
- DRYING AND WARMING SEATS.
- INVESTIGATIONS OF RE-CIRCULATION, HUMIDITY, AIR-CLEANING, DISINFECTION, ETC.

PHYSICAL EDUCATION

- PLAY AND PLAYGROUNDS.
- PHYSICAL TRAINING AND GYMNASTICS.
- MEDICAL GYMNASTICS.
- ATHLETICS AND LEAGUES.
- POSTURE AND CORRECTIONAL EXERCISES.
- ASSISTING IN MEDICAL SUPERVISION.
- RECREATION.
- SCHOOL EXCURSIONS AND TRAMPS.
- BOY SCOUTS AND CAMP FIRE GIRLS.
- GYMNASIUMS AND ATHLETIC FIELDS.
- SWIMMING AND BATHING.
- POOLS, SHOWERS AND BEACHES.
- FOLK DANCING.
- PHYSICAL EDUCATORS WITH MEDICAL KNOWLEDGE.
- HIGH SCHOOL CADETS.
- CLASS ROOM GAMES.
- PAY FOR SUPERVISING PLAY AFTER SCHOOL AND SATURDAYS.
- CULTIVATING THE GREEK IDEAL OF PHYSICAL AND MENTAL PERFECTION.

TEACHING HYGIENE

- HEALTH EDUCATION OF TEACHERS.
- ADVISING CHOICE OF BEST HYGIENE TEXTS AND TOPICS.
- FORMING PERSONAL HYGIENE HABITS.
- PUBLIC HYGIENE STUDY AND CO-OPERATION.
- HEALTH EDUCATION OF PARENTS.
- FEEDING, CLOTHING AND SLEEP OF CHILDREN.
- HOME HYGIENE IN DOMESTIC SCIENCE.
- VOCATIONAL HYGIENE IN INDUSTRIAL SUBJECTS.
- TALKS BY DOCTORS, NURSES AND SPECIALISTS.
- FIRST AID.
- SEX HYGIENE.
- STUDYING COMMUNITY HEALTH PROBLEMS AND METHODS OF IMPROVEMENT.
- DAILY ORAL QUESTIONNAIRE ON HOME HYGIENE: USE OF TOOTH-BRUSH, COFFEE DRINKING, VENTILATION, ETC.
- HEALTH KNOWLEDGE, HEALTH IDEALS, HEALTH EFFICIENCY.

HYGIENIC TEACHING

- "THE HYGIENE OF INSTRUCTION."
- FATIGUE, OVER-WORK AND UNDER-WORK.
- THE TYPE OF BOOKS.
- THE HYGIENE OF SCHOOL SUBJECTS.
- INTEREST AND ATTENTION.
- INTER-RECITATION RECREATION.
- TRANSFORMING NEURASTHENIC AND "CRANKY" TEACHERS.
- MOTOR ASPECTS OF TEACHING.
- THE GOSPEL OF WORK.
- THE HYGIENE OF JOY IN SCHOOLS.
- PREVENTING PHYSICAL DEFECTS AND PATHOLOGICAL CONDITIONS.
- SCHOOL PROGRAMS.
- PART-TIME OR WHOLE-TIME.
- INFLUENCE OF VACATIONS AND HOLIDAYS.
- HEALTH INDIVIDUALITY.
- HYGIENIC EFFECTS OF DIFFERENT METHODS.
- THE TEACHER AS MEDICAL GUARDIAN.

named: * play and playgrounds, selection of school sites and special phases of school architecture from the hygienic standpoint, pure water, school cleaning, gymnasiums, ventilation, heating and lighting, athletics, physical training, summer playgrounds, evening recreation centers, selection of textbooks for the teaching of hygiene, the print of books, problems of fatigue and school programs, home study, proper seating, feeding of the under-nourished, open-air and open-window schools, the work of school doctors, nurses, dentists, oculists, and the school clinics, co-operation with dispensaries, hospitals, infirmaries and private bodies desiring to aid school health work, and, finally, the education of the public along all lines of educational hygiene and the care of school children.

B. The Director of Hygiene should be a doctor of educational hygiene, or a doctor of public health (D. P. H.) Lacking training colleges for such men as yet, a physician who is a specialist in children's diseases and who has made a special study of the science and practice of educational hygiene, at least of physical education, and has had successful experience in it, should (by competitive examination) be selected. A number of physicians, qualified fairly well by study and successful experience in school systems, colleges, normal schools, Y. M. C. A.'s and children's hospitals and clinics, are at present available at salaries from $2,000 to $4,000 a year, and the demand will lead to an adequate future supply. Several cities now have such directors. After a brief search the writer has found twenty men qualified and available for such work.

The health of the children of the schools and nation will not be adequately preserved and protected until such a definite organization and such health leaders are incorporated in school systems. Efficient leadership furnishes

*See elaboration of these phases in *Hygiene and Physical Education,* for June, 1909, in *The Progressive Journal of Education* for September, 1909, *American Education* for April 1912, *Education* for December, 1912, in *School and Home Education* for May, 1912, and in *The Journal of Education* for February 27, 1913.

that scientific management, inspiration, and breath of life necessary in all successful social organization, and the school cannot afford longer to miss its advantages in the fundamental field of health.

C. Scientific Organization with Little Increased Expense. The expenditure for such a Supervisor of Hygiene, in cities that already are doing their duty to the children in the line of health, with school doctors, nurses and physical training teachers, frequently may require little or no addition to the present school budget, the work being merely that of reorganization of the various health provisions which have, in various ways and for several years, been coming into the school systems. In all but the largest cities the director can take the place of one or more part-time physicians, and can also do the work of one or more supervisors, or teachers, of physical training in the elementary schools. Money can also be saved by having him direct the summer playground work which now costs a number of cities considerable sums, the school clinic or clinics when started, high and elementary school athletics, evening recreation, and a number of other savings which may go to make up his salary. The nurses, when so directed, may take the places of attendance officers in many cities and so save another considerable item.

The present expenditures in these fields and the reorganized expenditures have been given in preceding chapters and tables. Most cities have not yet caught up with the school health needs; but most cities of average size can secure such departments of hygiene for little over *two to three per cent* of current school expenditures. In many, the *added* expense will, as suggested, be inconsiderable.

For further concreteness, the old and the new reorganized expenditures, for a fairly typical city already possessing the elements of such a department, are here given. This city has a population of about 50,000; there are 15 schools, a public school average enrollment of 6,000 pupils; and annual current expenditures amounting to about $250,000.

OLD, UNCORRELATED SYSTEM

2 high school teachers of physical training....................	$2,200
2 elementary school teachers of physical training.............	1,800
6 physicians, two one-hour school visits weekly, at $300......	1,800
3 school nurses, 44 hours a week, at ~~$750~~ 1000, ten months.........	2,250
Total	$8,050

RE-ORGANIZED, DIRECTED SYSTEM

1 supervisor of hygiene, full time, 11 months................	$3,000
2 high school teachers of physical education.................	2,200
1 assistant physician, two hours a day, ten hours a week......	~~400~~ 200
3 school nurses, 44 hours a week, 2 at $825, 1 at $750........	2,400
Total	$8,000

Here we have the new organized and directed system at less than the original cost. There remain fifty dollars toward more efficient records and blank forms. We have deducted nothing for saved expenditures for attendance officers, playground direction, etc., nothing but five unnecessary part-time physicians and the two elementary teachers of physical training. Where the latter officials are paid less in the old system and the supervisor $2,500 instead of $3,000, there is another balancing of expenditures. The point is that the added expense need not be great.

The third nurse may not be added the first year, which would give a further reduction of $750. Perhaps scientific management may make her permanently unnecessary in many cities.

The supervisor can, with the daily help of one of the two or three nurses, for two hours a day, examine the same number of children as the assistant physician, 3,000; and he can call the teachers together by grades and teach them how to carry on the physical-training work at the schools; and can take part of each day in supervising their work.

The assistant physician is paid $100 more a month, and gives *two full hours* in *one school* daily. With the assistance of one of the nurses he can examine during the school year the other half of the school population (3,000 pupils), and can help make such inspections as are necessary. The third nurse, if employed, is left free for individual and class-room inspections and for follow-up work. Neither the teachers nor the physicians are bothered with vision and hearing tests, the nurses making them; and practically all clerical work connected with medical supervision will also be done by the latter. The physicians will be free for technical medical work, and the teachers will be less interrupted.

Two of the nurses are paid for an extra month in the summer, one for July and one for August, to follow-up cases not cured at the end of the school year and for necessary inspection of children at summer schools and playgrounds. Some of the most valuable work now being done by nurses is accomplished in these summer months; and the number of skin, parasitic, and infectious ailments is very much less at the opening of the next school year.

The two high school teachers of physical training, one a man and the other a woman, are left at perhaps the same salaries ($1,300 and $900).

The supervisor of hygiene gives his entire time to the work, not for ten but for eleven months. If he obtains a thoroughly good assistant school-physician, the salary of the latter may be raised from $400 to $500 or more, but not sufficient to make possible the employment of another nurse at the same sum, perhaps. It may be well to employ a woman physician as part-time medical examiner so she may better examine the high school girls.

The trials and tribulations of the superintendent in trying to get regular and responsible work from part-time physicians and in attempting to direct medical work without medical knowledge, are now at an end. He has a small, compact and almost entirely full-time force. These are essentials. The entire part-time element may yet be eliminated, but it will mean salaries from $1,500 to $2,000, at least, for full-time assistant physicians.

Later developments of the system can be made, however, after intelligent study and experience. If another physician is desired he may be obtained, and if, as the city grows, an assistant in physical education for the elementary schools is found necessary, the addition can be made. But these additions are intelligent choices by an expert in educational hygiene, after reasonable investigation. We attempt to give here only minimum essentials and suggestions for beginning or reorganizing the work.*

For the largest cities, such a health reorganization can easily be made, and it is practically possible for many cities

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*At the recent International Congress on School Hygiene at Buffalo the writer was given practically the following facts by a member of a board of education of a typical New England city (about 9,000 pupils) with a request for a plan of efficient reorganization:

PRESENT "INEFFICIENT" SYSTEM

12 part-time physicians at $500	$6,000
0 nurses	000
2 truant officers	2,500
1 elementary physical training teacher	1,000
1 summer director of playgrounds	150
	$9,650

This system, recognized by the board of education as inefficient and not getting results, is a finely devised machine for getting little more than a collection of pathological statistics of school population. The time the physicians spend in the schools is unknown; and they have no supervision nor nurses to follow-up cases and get treatments and cures. There are no public dispensaries for free treatment of children, and a large share of the population is too poor to pay $20 for an adenoid operation, for example, or to provide regular daily or weekly treatment for favus, ringworm, discharging ear, and other ailments. There is enough money being spent, however, to get efficient results in this field. Leaving the high school directors of physical education in their places at the same salaries, we gave for a beginning the following:

PLAN OF REORGANIZATION

1 supervisor of hygiene, a physician-physical-educator	$2,500
6 school nurses, 4 at $700, 2 at $770	4,440
2 part-time physicians, two hours daily, at $500	1,000
1 school clinic, with dental, surgical, and medical divisions	1,000
1 school dentist, with staff of voluntary dentists	500
New blank forms for records and reports	210
	$9,650

Here we have a vastly more efficient system at the same expenditure of money; we have skilled leadership and supervision; we have a plan which unifies all school health agencies; and we have the emphasis where it belongs, on prevention and cures. Necessary changes can be made after adequate investigation by the hygiene supervisor and superintendent of schools.

almost as small as eight or ten thousand population. *Several towns may even go together and employ such an expert,* as superintendents are now employed in several states. And even *rural* districts may unite in the same way for the expert services of an educational hygienist and several nurses. The great need is for health experts and for health leadership. The people will respond and act along the best health lines when the health knowledge, now the possession of the few, is made the possession of the many. We have suggested here a possible channel for such general health enlightenment. The far-reaching influence of such school health leadership on national health and vitality can as yet hardly be imagined.

D. Other Plans for the School Medical Service

Disregarding as ineffective the *physician-alone plan* for school medical work, we have two principal alternatives for serious consideration: the *physician-and-nurse plan,* already suggested, and the *nurse-alone plan.* For both there is the need of a supervising director of hygiene, unless the superintendent of a small city is exceptionally well qualified medically and has time to devote to the work. We need supervisors of hygiene as much or more than we need supervisors of music, drawing, and such subjects. For both plans we may have either examinations with inspection or only inspection alone. We shall take the stand that routine *examinations,* annually, are important as well as inspections. In the nurse-alone plan the routine *inspections,* with the use of individual cumulative health record cards, can, at first, take the place of complete medical examinations, by simply adding the vision and hearing tests.

The nurse-alone plan is, in general, far superior to the physician-alone plan, for a number of reasons, chief of which is that the former gets treatments and cures for a large percentage of the cases, while the latter procures treatment and cure for but five or six to twenty per cent of the cases. Furthermore, the nurses can find most of the cases of all kinds, and can inspect satisfactorily, as proved in New York, for infectious diseases, especially when under supervision (September, 1911, Report of Bureau of Municipal Research). Cities as small as Canton, Mass., with less than five thousand population, and as large as Oakland, Cal., with nearly two hundred thousand, get good work with only nurses, under supervision. (Reports and letters of Dr. Arthur T. Cabot and of Dr. N. K. Foster, respectively.)

Newark with 38 doctors and 8 nurses is reversing these figures by exchanging two doctors for each added nurse. Only five or six doctors will be kept as district supervisors of the nurses. With the general supervisor as before this will greatly increase the efficiency for the money expended. Further, the physicians can work but part-time while nurses devote their entire time to the work. The physicians are irregular and difficult to control in large numbers, while the nurses, with practically no serious competing interests, are easily directed. And, finally, they are less than half, and frequently only one-fifth as costly, hour for hour, and for the year, as physicians. The tables given in former chapters show even greater disproportions of cost in a number of cities, when the annual number of daily visits, and number of hours each, are taken into consideration. Good, regular physicians, furthermore, can spare little more than two hours a day regularly and punctually from their practice; and physicians for longer periods must be paid too much and cannot well stand the strain and monotony of long-continued examination or inspection. Diminishing returns, with the larger salaries for full-time physicians, bring in the school nurse often much more efficient hour for hour than such physicians as can be obtained. That the nurses need *training,* before and while in service, and that they must have competent *supervision* is immediately apparent. The plan here outlined, however, places the emphasis upon the nurse *and* the physician, the physician-nurse plan. Getting full-time work from all school health officials remains a nice problem for careful study and local adjustment. The first thing is to get the hygiene supervisor, next the nurses, and finally part or full-time physicians. A very small city unable to obtain, with others even, a supervisor should start with a nurse rather than with part time physicians if possible. If only a physician is employed the principal and teachers must do the follow-up work. In either case the record and report forms herein given may be used.

E. Where to Obtain School Nurses.

As with all other forms of public service, the success of medical and health work depends very largely upon the character of the persons chosen to carry it on. The greatest weakness of our school systems at the present time is due to the fact that our teachers are quite generally young women novices with a teaching tenure of three to five years only and very largely ignorant of and inexperienced in the real life of the community and nation about them. Educational readjustment must wait upon the improvement of the character of the teaching force. With even the best of supervision and the most scientific plans of management the health service likewise can remain palsied, feeble and inefficient.

After deciding to obtain officials for the school health work, therefore, the practical problem becomes one of obtaining high-class health agents. For nurses, we must as yet depend very largely upon the various training schools for visiting nurses, and the visiting nurses' associations. The Department of Nursing and Health, under the direction of Miss M. A. Nutting, R.N., at Teachers College, Columbia University, in New York City, is at present the only institution in the country which gives instruction and training for school nurses, and the number who can be supplied is at present very small. This is the first source I should recommend.

Miss E. P. Crandall, R.N., Executive Secretary of the National Organization for Public Health Nursing, 52 East Thirty-fourth street, New York City, and Miss E. L. Foley, R. N., Superintendent of the Visiting Nurse Association, 104 South Michigan avenue, Chicago, may also be depended upon to advise school systems of graduate nurses who are specially qualified for and looking toward public school work. Miss Fannie F. Clement, 713 Union Trust

Building, Washington, D. C., can give valuable information regarding the Red Cross Rural Nursing Service and persons available as school nurses. The Boston District Nurses Association in affiliation with the Boston School for Social Workers, as well as the Cleveland Visiting Nurses Association in affiliation with Western Reserve University, and, finally, Phipps Institute of Philadelphia are also in touch with most nurses in the country.

The writer will be pleased to send the names of any persons known as qualified either as hygiene supervisors or as school nurses to responsible persons without charge to either party. Like Albany, N. Y., a city may find in its midst a man qualified both as a physician and a physical educator for such work and good nurses amenable to training in the school service.

II. THE DIVISIONS OF MEDICAL SUPERVISION

The various phases or divisions of the work of medical supervision * in this plan and, for the most part, but largely unrecognized, in the best systems now in vogue, are about as follows:

A. Preliminary clinic, for instruction and standardization.

B. Inspections.

1. Pupil Inspections.

   a. September *room*-inspection of all pupils by doctors and nurses.

   b. *Occasional* room-inspections of classes of children, by nurses.

   c. *Individual* inspection, by teachers, nurses, and doctors.

2. Environmental Inspections.

   a. *Home hygiene* inspection, during home visits of nurses.

   b. *Sanitary* inspections of the *school* premises, by any delegated and competent officer.

C. Examinations, complete physical, annually for all pupils.

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*The term will probably remain medical inspection, even if it is a misnomer in good systems.

1. *Scholastic*: vision and hearing examinations, and perhaps others, by the nurses.
2. *Medical*: only those technical phases which the nurses cannot do well, if any, by doctors.
3. *Anthropological*: measurements of height, weight, chest-expansion and the like, only *if required.* Of doubtful value.
4. *Work Certificate*: will probably not be needed in well conducted systems.

D. Treatment, Cure and Correction.

1. By home and family physicians, dentists, or oculists.
2. By school nurses.
3. By dispensaries or other free clinics.
4. By public school clinic, with various divisions.

E. Prevention.

By looking for causes, co-operating with other divisions of educational hygiene, and other public and private health agencies, and by placing the emphasis upon *preventive* rather than merely *curative* agencies.

How to carry on efficiently and economically these different phases of the work will be the problem of this chapter.*

A. The Preliminary Standardization Clinic

In the typical city for which the reorganized expenditures were given, with a proportion of little over three per cent of current school expenditures for the entire department, including medical inspection, we have two physicians and three nurses for six thousand pupils from kindergarten through high school, three thousand for each physician (one the director), and two thousand for each nurse. For a city of twelve thousand children we should have, of course, twice as many nurses and three assistant physicians. But no matter how large or how small the department may be, even one physician and one nurse, there should be, when they begin to work together, and, if several, at the begin-

*For relative complete "Outlines of Educational Hygiene," emphasizing medical supervision, by the writer, see *Education* for December, 1912.

ning of each year or oftener, *a meeting at which children are examined or inspected, or both, and standards for referring cases to parents, for exclusions, for readmissions, for best methods of doing the work, and the like, are discussed.* Teachers and principals may be present at such meetings, and all may take a hand in coming to some common agreement, without which there will, in isolation, develop the greatest irregularity among different workers and frequent injustice to children and parents through conflicting standards and methods.

This is also the opportunity for the supervisor to outline the work of the year, and to get suggestions from all concerned as to its improvement. It is a time for inspiration and education. All need them. Such clinics can be held at one or more of the several schools, if desired, or at teachers' meetings, for the purpose of giving the teachers necessary elements of child-study of a medical character, which probably never appeared in any course in their professional preparation.

No city known by the writer now employs this means for making efficient medical supervision, and he hopes for its speedy experimental testing. Besides these will come, of course, monthly or semi-monthly department meetings which are now quite common in good systems.

B. Inspections

I. PUPIL INSPECTIONS

a. September *Class-room* Inspections.—Since this plan of administration gives the physician as many pupils as he can *examine* in the entire year, beginning in September about the third week, and taking pupils in the same order each year, we must provide what many cities have been driven to by hard experience, namely, a preliminary, complete, routine, *classroom* inspection of all pupils. With 3,000 pupils, each pair of nurses and physicians will have about 75 rooms, counting 40 pupils to a room. By requiring the part-time physicians to spend three hours a day in this first general inspection, and with the nurses all at the same work, counting a classroom, after practice, for each half-hour, and records made, where two work together, we can see that the entire inspection can be made in about two weeks. In the case of the two doctors and three nurses, one nurse would have to work alone at such inspections; and in the afternoons when two of the nurses worked together in each room another would be left to work alone, as she must later in *occasional* room inspections. In fact, we can be sure of over 20 rooms inspected a day from the small force of five above mentioned, which for the total of probably 150 rooms in the city, would make about eight days. So two weeks would probably be ample with such a system.

Some doctors lay claim to 250 pupils room-inspected an hour, but these are only very partial inspections, for signs of parasitic or infectious disorders. This first general routine inspection would make a fair substitute for an examination, especially if there were any careful attention given to vision and hearing. It is a general inspection of the child for any *serious* defects, ailments or conditions which should receive early treatment and care. No vision or hearing tests, as such, are made, but all obvious cases, like strabismus (cross-eye), or inflamed eyes from eye-strain, may be recorded and referred with instructions.

The principal ailments found will probably be minor skin ailments of a filthy or infectious character, although most ailments will be represented. If there have been nurse-inspections during the summer, fewer cases will be found, but there are always sufficient numbers to warrant rigorous measures for nipping their spread in the bud.

THE METHOD OF CLASSROOM INSPECTIONS

The central instrument in all medical supervision (inspection) is the *individual, cumulative health record card of each pupil.* On it is recorded the health history of the child during his school years, and in some cases for the years previous to his entering school. The development of the science of educational hygiene and the practical control of health matters must depend very much upon the quality of such individual health histories. Scientific control of living conditions of children, or of any other phenomena, rests upon the basis of accurate and carefully selected facts. With this principle in mind, and the progress of child and of educational hygiene as a much-to-be-desired practical necessity, by what standards shall we judge such health record cards? Tentative standards used by the author are as follows:

a. The record must be a separate filing card, not a page in a book, nor a loose sheet of paper. The greatest device, or instrument, for inductive thinking yet invented is the well-devised card-index system. Professor Giddings well says that Jevons' invention, of a "*deductive* logic machine," is but a useless toy compared with the modern "*inductive* logic machine," the card index.

b. This card must go with the child from room to room, from school to school, and from city to city throughout his school life. The cities that are using cards good for one year only are wasting money and not getting the cumulative history which can always be before teacher, nurse and physician when they study the child from the standpoint of his health.

c. The record must, as nearly as possible, contain each child's *entire* health history, especially of serious diseases, injuries, or defects, winter or summer, and the results of treatments, and dates of cures.

d. The records must be made by both physicians and nurses, and their records distinguished, say *black* ink for the physician and *red* for nurse. With our plan most of the records will be in red ink. Examinations by specialists, dentists, aurists, or oculists can also be recorded on the same card.

e. Arrangement must be made for recording the changing addresses, rooms, and schools of pupils. The telephone number of the parents is desirable wherever it can be obtained.

f. The results of both examinations and inspections are to be recorded.

g. The card must either have the diseases and defects most often found and most to be emphasized printed thereon, or be used in constant connection with a detailed and numbered list of such ailments (code), for which only the code numbers need be used, or the code number accompanied by an abbreviation for a special and unusual ailment. The Cleveland card, most carefully drawn up, has a code entirely too brief printed upon it, and has no satisfactory arrangement for recording treatments and cures. The New York city and the cards devised by Burks, Hoag, and Cornell have similar or other serious defects.

h. The card must leave space with each year's record for *writing* in any general recommendations, suggestions to teachers, and the like, which are so individual that they cannot be reduced to code numbers or other signs. Real health records have been practically prevented by attempting to reduce the whole matter to making checks opposite a few ailments.

i. The signs, or symbols, used to save space and time and for a degree of privacy, if desired, should very probably be printed on each card. The need of keeping the children in *entire* ignorance of their ailments does not appeal to the author's experience. Democracy is better. Some of these signs, to be found on the card offered herewith and devised for tentative testing by the author, may well be:—

X—A cross, for "needs treatment, and should be referred to parents."

O—a circle around this cross, to be made by the nurse when the ailment is *cured.*

O—a circle in the second space, to the right of the X, showing that the ailment has not been cured, but has been *improved.* No circles will show that the case has not been cured, or improved, or the child has moved away, without his card, or the family

INDIVIDUAL HEALTH RECORD CARD, NUMBER ONE

HEALTH RECORD

Name: Brown, Grace C. (surname) School: Hillside

Address: 417 Madison St. Montclair Public Schools Room: B C D E F

Phone: 367 J. Date of birth: May 20, 1903

X = needs Treat, Referred. ⊗ = cured. O = improved, not C. ✓ = minor, not Refer. E = excluded. R = readmitted. Nurse uses red ink.

First Year 1910–11	5	Enl. Tonsils	⊗					Found Sept. 10. | Home V. 9/15 Family P. Widow. | N. Dis. 9/22 Tons.
	1	Adenoids	⊗					" " " Both seem cured. 10/2. and ade. removed
	42	Ped. & N.	X	O	X	O	X	O | Exam. 9/14 | V. 9/15 above. Mother promises T. | 9/22 mother T. O | 3/25 mother T.
	6	Vision	✓					O.K. R 20/20 L 20/30 No Astig. No E. strain. With glasses.
	3	Hearing						O.K.
Second Year 1911–12	1	Adenoids	X	O				9/13 recurrent. N. Dish. Nostrils dilated by M.D. O. Mouth Br.
	42	Ped. & N.	⊗					9/13 " Treated by Janitress. Seems C.
	50	Scarlet F.	⊗					9/20 H. Quarantined two weeks. Very light case. | Insp. daily 5 times
	40	Impetigo	✓					Exam. 11/15 | Tr. by N. | O.K. 11/20
Third Year 1912–13	40	Impetigo	⊗					9/5 T. N. | O.K. 9/10 | C.
	6	Vision	✓					O.K. Wears glasses that fit. Needs them.
	4	Teeth	⊗					Exam. 10/2 | 3 T. Caries | V. 10/15 | mother Prom. | Free D. Clinic N. 10/20
Fourth Year								
Fifth Year								

Always bring this card to the Examination or Inspection has refused treatment, or the family physician has called the case "negative," that is, too minor an ailment for treatment or operation. A diagonal line may be drawn through admitted negative cases and deducted from the number previously reported.

|—a vertical line, to the right of the X or O, showing in *red* that the nurse, janitress, or school clinic has treated the case, and in black that some other "outside" agency has made a treatment or series of *treatments*. Red lines over near the space for remarks on the same horizontal line, or to the left of this space if desired, may be used to indicate times the nurse has taken the child to dispensary, family physician, or clinic. Home hygiene visits, or simply home visits, may be similarly recorded under that heading.

P—in the space for the date of the annual *medical* examination at the top will mean that the *parent* or guardian of the child has been present at that examination. This is important, for better results frequently follow if parents are present, and the records should show it. In general, however, parents attend much better with their children school clinics.

V—a check, in place of an X, will show that the ailment is too *minor* to be referred for treatment. Few such checks will be required. Certain incipient ailments must, perhaps, be noticed in this way, however. The discretion is with the supervisor or other officers. Too many very minor cases are now being recorded in many cities. Be conservative. Check cases need not be reported.

E—will show that the child has been *excluded* for the ailment marked X.

R—will show that the child has been *readmitted*. The teachers will keep a record of the time lost by all exclusion or illness absence and record it at the bottom for each term each year.

Other signs can be devised for other meanings.

In the space for remarks, the medical officials will write such facts or suggestions as cannot be given by the system of signs.

The back of card number one is not here reproduced. Four horizontal spaces at the top may be left for: the pupil's name and addresses, the history of measles, scarlet fever, diphtheria, whooping cough, chicken pox, vaccination and other ailments with spaces for checking or writing in the dates, the nationality if desired, and spaces for changing room numbers or letters. The fourth space may be used for the symbols given on the face, and for others desired. Below the headings, the card may be made up the same as on the face, for three years.

To the right of these, I have a section for *Home Hygiene Inspection,* printed in the space for dates of examinations and presence of parents, somewhat similar to the Cleveland and the Hoag cards (see Health Index of Children). Beneath this heading on the 25 lines I have printed (with five vertical spaces to the right) the following: Grade, Date, Children in school—Boys, Girls, Number of rooms, Number of bed-rooms, Number of beds, Bath tub?, Ventilation, G—F—B (good, fair, or bad), Lighting, G—F—B, Cleanliness, G—F—B, Number of families using closet, Financ. (for financial condition), G—F—B, Nourishment, G—F—B, Children's hours of sleep, Home study opportunity, Mother, Father, Sisters, Brothers, Boarders, Co-operation with the school (i. e., how well they respond to the nurse's and teachers' efforts) and spaces for writing in other data. This matter is, of course, unnecessary on card number two.

FURTHER SUGGESTIONS FOR USING THE RECORD CARD

It is relatively unsatisfactory to attempt to place under even twenty-four headings the ailments which physician and nurse must look for and record. One line may be overcrowded while there are left many lines unused, and ailments not printed thereon may be found. To overcome this difficulty, a space over a half-inch wide has been left for writing in the name, abbreviation, or code number found in the weekly report for fifty-four ailments and groups of ailments, the term "ailment" referring to all the health disorders of childhood, including physical defects.

Still further to overcome this difficulty, all names of ailments may well be left *off* the card, the spaces mentioned widened for each year entirely to take up the space where names for ailments are printed, and only code numbers used in the first narrow column for ailments each year. The figure (code number) there would indicate that the ailment had been found, and the signs above mentioned would follow as before, on the same horizontal line. Or the card may be entirely reorganized on a freer basis, giving one like the second type here reproduced.

CARD NUMBER TWO

The principal disadvantages of the first card are (1) that it is impossible to write on it the entire series of efforts which may be necessary to get cured one case, resulting in the overcrowding of one line or two and leaving blank a large part of the card opposite ailments from which the child does not suffer, (2) that since the names of ailments must be general and in only 24 divisions, the code numbers and the abbreviations or full names of the specific ailments must be written out anyway. Even with a card long enough vertically to make possible the printing of the 54 classes of ailments, it would still be necessary to write in the specific name (say, for minor skin diseases). Another weakness is the home hygiene inspection division separated from the ailment and time of inspection or following up of the case. Yet this card has been declared, by a committee studying the record systems of over seventy cities, superior to all in use. Burks' interesting card or slip (Health and the School, page 179) has the same and other defects, his system being devised more for such large cities as Philadelphia, with large central office forces.

Our card number two of which the face, partially filled in, is given, has been evolved out of all these defects and difficulties. It gives freedom to record essential data not easily placed in a system of rigid symbols, economizes

HEALTH RECORD

Name ______ surname ______ School ______ Date of Birth ______ ,19

Address ______ Public Schools | Room | | | | | | |

Phone

X=needs treatment, referred. ⊗=Cured. O=Improved, not cured. V=minor, not Ref. E=Excluded. R=Readmitted. Nurse, red ink.

Date of Examination		Remarks:		Remarks:		Remarks:		Remarks:		Remarks:	
1 Adenoids or N.O.											1
2 Anemia or Malnutr.											2
3 Deafness, Def. Hear.											3
4 Dental D., Teeth											4
5 Enlarged Tonsils											5
6 Eyesight, D. Vision											6
7 Glands, enlarged											7
8 Heart or Lungs											8
9 Nervous, Chorea											9
10 Skelet, Curvature											10
11 Other Phys. Defects											11
12 Digestive System											12
13 Ear Ailments											13
14 Eye Ailments											14
15 Respiratory Tract											15
16 Skin Ailments											16
17 Skin Ailments											17
18 Wounds, Sores, etc.											18
19 Other Common Ail.											19
20 Other Common Ail.											20
21 Communicable Ail.											21
22 Communicable Ail.											22
23 Communicable Ail.											23
24 Communicable Ail.											24
Days lost thru Illness:											X

Always bring this card to the Examination or Inspection space, shows immediately what ailments have been found and what has been done with them, records both inspections and examinations and all dates, and makes possible adequate reporting of follow-up and home hygiene work. Most of it will be filled in (with red ink) by the nurses. Another space may be used for printing in other symbols while the number of lines for the second year may be decreased to four. The card may be arranged for ten or more years of school life, five or six years on each side. The heading for the back of card 1 should also be used for this card. No home hygiene space need be arranged as this has been provided for each year. For special cases, the five lines for the first year may be used for a careful health history.

The card will, of course, be used with the classification and nomenclature of ailments in view as they are printed on the weekly report.

Interpreted, some of the written-in record has the following meaning: For the first year, 1910-11, enlarged tonsils and adenoids were found at the time of the first (September) routine inspection of all children. We see at once that they were found and cured. They were referred September the tenth, but the family did not respond well; so the mother, a poor widow, was visited on the fifteenth. The latter gave the nurse permission to take the child to the dispensary where her adenoids and tonsils were removed on the twenty-second. The nurse should have seen the child every day or two immediately after the operation, but probably wisely depended upon a responsible teacher to send her for inspection if her wounds did not heal well. On the second of October, however, she did inspect the child, then seven years of age, and found her apparently cured. She could not then state whether the adenoids would grow again· but apparently the child was developing satisfactory nasal breathing, in place of the former mouth breathing.

For some reason, the child was given her annual examination on September the fourteenth, which resulted in the finding of pediculosis and nits, but her vision was good with her glasses on, and her hearing was satisfactory. The subject of pediculosis was brought up at the first home visit recorded above and the mother promised treatment which she carried out, with improved condition, and twice afterward following notice by the nurse. The examination showed the ailment; it was improved; two inspections showed the ailment later, and it was again improved. The teacher had evidently sent the child to the nurse for the inspections or the nurse had kept after the case and called the child out those two times.

The next year, 1911-12, the child was again mouth-breathing and the adenoids had probably grown again but the nurse took the child to the dispensary and an operation was spared by the dilation of the child's nostrils. This should have been done, and perhaps continued by the nurse, during the first year. The other items are probably easily read. V equals home visit; T equals teeth; Tr equals treated or treatment; H equals board of health. Any added symbols should be uniform for each city, at least.

Where a child presents unusual need for treatments, the spaces for two or more years may be used for recording them. A five by eight card should be standard since the smaller ones unnecessarily cramp the work. Our card number two has been reduced for book purposes to a seven-inch length. We have not shown a record of days lost by illness nor a very wide range of home hygiene reporting, although the form admits of it.

Either of these cards, printed on both sides, and containing the names of the places using them, and the other forms given later, will be sold in quantities by the publishing department of Teachers College, Columbia University, New York. The appearance of the cards will be improved by *printing* in all words.

Where a child spends more than eight years in the elementary school system or enters the high school, another card may be clipped to the original card. In fact, for very serious and prolonged cases, the annual spaces with dates above may be turned into *term* spaces and an additional card added earlier than the ninth year of school life. Whether cards should begin with the kindergarten children, may rest with the medical director, and superintendent of schools. They probably should· with the exception of the vision test perhaps. Provision for changing addresses may be made by furnishing gummed strips of paper the size of the address space. This is a compromise plan to save space. On the second card the addresses may be written in the first space to the right of the symbol spaces for each year after the spaces at the top have been used.

Thus we have offered two record cards instead of one for use, adaptation, and criticism. The first has many advantages, but limits seriously the amount of space for recording the facts regarding any one ailment; the second is simpler, and gives plenty of space for recording the nature and treatment of any ailment. It also affords more chances for error in using and interpreting the code numbers, perhaps. The second will probably win out after trial.

These cards (5 by 8 inches in size) may be kept in the *teachers'* classrooms in small, durable filing cases, such as are furnished in New Bedford, Mass. It is probably not wise to keep all the cards together in the medical inspection room, for several reasons. At each inspection or examination the child takes his card in a clean piece of paper, or one child carries several of the cards, or some other person, nurse, janitress or principal's clerk, collects them, and takes them to the health officers' room. For *room* inspections, of course, the cards need not be taken out of the rooms, except as the nurse uses them for making her records and reports. If the health histories are to be used and if teachers are to be educated in health watchfulness, the cards must be kept before them in their rooms.

The "parasitic ailments" are favus, ringworm of body or scalp, pediculosis or vermin, scabies, and one or two others seldom if ever found. Where a child has two such ailments, use the space for infectious ailments or for skin ailments in the section above, writing in the name or code number on the right. (No such trouble will arise with the second card presented.) Physical defects are placed at the top as in the weekly reports and the tentative standard classification of ailments.

THE METHOD OF THE SEPTEMBER ROOM-INSPECTION

Coming back to the September room-inspection with an understanding of the individual health record cards, let us briefly suggest a workable method. In one of the first plans of this kind drafted by the author in 1908, the doctor and nurse were to go to separate rooms and the teachers were to make the records on the cards for them. If teachers could do this well or if it were thought valuable enough training to take the time to teach them, this would be satisfactory; since the general room-inspection at any time could be done about twice as rapidly as when the nurse and physician work together. Teachers, of course, need such training and knowledge of both the cards and the children.

However, the nurse frequently needs the doctor's supposedly better knowledge and advice, and she can record the matter on the cards very much better than teachers. Doctors who have tried both methods say that the rapidity and ease with which the nurse and doctor working as a team can do room-inspection eliminate all other methods. The nurse, however, cannot see each case so well when she is sitting at a desk busily copying signs; and most values might be gained by having the teacher make the records with the nurse free to watch both her and the doctor. This probably deserves test. It serves to educate the teacher, but leaves the class-room of children to some extent, undirected, although a strong teacher can use the situation as she thinks best, either for continued study by the pupils or for watching the work proceed, and getting an intelligent attitude toward health matters. This is again a matter to be tested. The outcome will probably be that the nurse will record and learn to see the cases too.

Near the back of the room on the left side of the pupils will probably be found good light. Here the doctor can take his stand and the pupils by rows of five or six, or boys first and then girls, or in any other convenient way, can file pass him. He may be seated, since it is well, with certain exceptions, to start with the pupils in the lowest grades in both general inspection and in examinations.

The nurse, let us say, sits at a desk nearby and records the doctor's findings and the disposition of each case. The physician gives a quick, accurate glance at hair, scalp, ears, eyes and eyelids, face, nose, mouth, teeth, tonsils and throat, hands and skin, and quickly sizes up the general condition of the pupil. The doctor does not touch the pupil but has each child open the mouth, show the hands, pull down the eyelids, perhaps, and, in the case of girls, lift up the back hair. Wooden tongue depressors are used for the mouth examination, and no depressor is to be used more than once. Where plant tag-sticks are used for depressors each one may be broken in two and used for two pupils. With increasing skill, all the pupils of a room can be inspected in a very short time, less than a half hour, and averaging, perhaps, two pupils to a minute.

The standard for the selection of cases for record can be seen in the following question which the doctor must ask himself: May this child remain in the school without injury to himself or to others, and is this ailment one which should have immediate care and treatment, and one about which the parent should be informed? If, in his judgment, and probably with the advice of the nurse, he concludes that it is a sufficiently urgent case of any kind, he gives the nurse the code number of the ailment from the printed code before him, and indicates what shall be done with the case. If he is in some doubt, the child is asked to take his seat or pass elsewhere until after the other pupils are inspected, and may then be taken into the hall or health room for further inspection. In Newark, N. J., at most room-inspections the pupils go singly into the *hall* where they are inspected by the doctor, the nurse, or the two together. This plan has its advantages.

The doctor should be conservative and practical in his judgments. Most minor uninfectious cases may wait for the routine examination when the parent may be present. Further standardization can come with experience, supervision and standardization clinics.

EXCLUSIONS

Doctors and nurses must also be very careful and conservative about the exclusion of pupils from school. On the average, such exclusions last, for all ailments, nearly two or three weeks. Some are unnecessarily excluded for months. Most of the parasitic ailment cases may remain in school with adequate treatment and control. Where an epidemic of infectious disease is imminent less suspicious cases may be excluded and throat cultures taken, but conservative judgment is not even here amiss. The nurse should take cultures in every case of sore throat. These cultures must be tested and the children readmitted if negative (i. e., if the Klebs-Loeffler baccilli are not found) *as soon as possible.*

Children requiring exclusion may be given an exclusion slip at the end of the inspection of that room, or immediately, if desired. The principal of the school may have such children referred to him, and may mail or send the slip to the parents from his office, besides sending an oral message by the children. Or, the telephone may be used. The teacher should be notified of the exclusion and of the date fixed for the child's return to school. This may be written on the card protector.

Exclusions may be made for the following infectious ailments: *diptheria,* or *sore throat* or *tonsilitis* possibly pointing to infection, *scarlet fever, whooping-cough, chicken pox, measles, mumps, trachoma,* or any other possibly acute infectious disease, and such *parasitic* and minor infectious ailments as may be adequately treated over night if strongly called to the parents' attention. Montclair and some other cities have such cases treated in the school by the nurse or janitress, thus saving very much absence. Parents are tried first, and then, if the home does not adequately eradicate the ailment, permission is gained for the school treatment. Legal compulsion may be required, and should be used without fear or favor for the "filth" disorders.

The nurse may make out the exclusion slip which should be simple, dignified and adequately instructive. If the back can be used for health advice, the chance should not be missed. The seal of the city printed on each as is done in the state forms of Massachusetts and certain cities, will appeal in the right way to many parents. The following exclusion form has several advantages in the way of economy:

EXCLUSION RECORD

No...............

Date............., 191..

School...... Room......

Pupil ....

Address ....

Cause of Exclusion:

....

....

Readmitted,

................., 191..

School days lost..........

MEDICAL SUPERVISION OF SCHOOLS

Montclair, New Jersey.

Date...................., 191..

School...... Room,..... Grade.....

Pupil's name.........................

Home address......................

The above named pupil is hereby ordered to discontinue attendance at school temporarily for the following reasons:

....

....

....

School Nurse, M.D.

(Hand to pupil excluded.)

over.

This entire form need not be more than six inches long and two and a half inches wide.

On the back of the long part, not the stub, should be printed these and any other directions, general advice, or short article from city or state laws:

The ailment mentioned on the other side of this notice is infectious (contagious), and liable to be transmitted, or "given," to other children. The child should receive prompt treatment by a physician or the school nurse, and should return to school ...., 191.., for inspection by the school physician or nurse. If found free from infection he may then resume attendance at school.

Every reasonable effort should be made to give each child the full benefit of every possible day of school attendance.

A DUPLICATE BOOK FOR DOCTOR AND NURSE

This form, separable from its stub, should be printed as is a check book, and, whenever desirable, as in the case of acute infectious diseases, will, with small sheets of copying carbon, give four forms, the original for the parent, the stub for the hygiene department, the carbon copy for the board of health as their notification, and the carbon stub for the nurse's or doctor's record. The notice can be sent home in several different ways, depending upon circumstances. One of these exclusion books should be kept in each school, and for its pupils only.

To avoid conflict of jurisdiction, the city health officer and the director of hygiene, or superintendent, should meet and agree upon a plan of co-operation for readmitting pupils after exclusion or illness absence. The following is the result of such a meeting at Meriden, Connecticut, in the year studied and about a month after the work of medical supervision had begun:

"It was agreed that the city health officer should write permits for returning to school after exclusion for smallpox, scarlet fever, diptheria and membranous croup, and that the school physician only should write certificates for returning to school after measles, whooping cough, consumption, chickenpox, mumps, sore throat, lice, scabies (itch), and other skin diseases, and other minor ailments."

And it was furthermore agreed that the school physicians should give no readmission for diseases assigned to the health department and the latter agreed to sign no permits to return for diseases assigned to the school physicians. Practically, then, the school medical service readmitted pupils for everything except scarlet fever and diphtheria, since small-pox is seldom if ever found.

Notice of cases of acute infectious diseases like diphtheria, scarlet fever, measles, German measles, perhaps, small-pox, if ever found, and chicken-pox should be immediately telephoned to the city health department, the exclusion notice being sent later, if necessary.

The board of health will, of course, notify the schools each day of all children ill with infectious diseases, quarantined or not, and also when these pupils may be readmitted. Such ailments whether found in the schools or not should be recorded on the record card and in the reports.

Conjunctivitis, impetigo, trachoma and the parasitic ailments will be handled by the nurse. For trachoma, she will find it best to give instruction rather than treatment.

Rare cases of tuberculosis should be reported to the superintendent or director of hygiene for special consideration. When diphtheria develops it is well to culture the throats of all children in the class to discover possible carriers.

THE SPIRIT OF THE INSPECTIONS

Let us remember that we are still in a primary room of a school in our typical city at the work of the September class-room inspection. A great deal will depend upon the spirit in which such work is carried on. Physicians are frequently very unpedagogical in their treatment of the children; and some of the cases of such unpedagogical treatment, witnessed by the author in dispensaries and at school inspections and examinations, would appropriately bear the title of "Crimes Against Childhood." Individuals, male or female, found unadapted for this personal, humane work with children should be relieved of it as soon as they can be discovered. The atmosphere of school medical work should be that of health, happiness, and co-operation, not that of so many of our public dispensaries.

REPORTING THE ROOM-INSPECTION

When the class has been room-inspected, to coin a word, the nurse will take all the cards of ailing pupils to the principal's office or the health room, where they can be reported after the morning's work with the physician. In her case book for each school she will write down the name, address, room and ailment of each defective and ailing child and the date. When she sends notices home with the children who are ailing but not excluded and gets no satisfactory results in treatment within three days or a week, the time for a second notice, or for home visiting has come, which may even end with the doctor's visit or that of an officer of the law. After the list of cases has been placed in her book, the cards can be returned to the room, where the teacher will give them a *separate* place in her file, or mark them with colored clips. At the end of the day, the nurse will record all the work of inspection and the findings in the column for that day's work, on the weekly report form. This daily and weekly report will be treated under "examinations."

b. Occasional Room-Inspections

Occasionally, other room-inspections (*special* room-inspection is a good term) must be made by the nurse after the routine one in September. Very rarely will the doctor be needed for such work. The ailments found, she can herself record; or, where there are very many cases, she may find the co-operation of the teacher very helpful. The method can be that of the general inspection described, or she can simply pass along the aisles and inspect the children. The latter can have their hands on the desks, and the nurse, passing along from the rear, can easily note the condition of the hair and scalp, as well as other features. *The nurses of Newark made an average of nearly* 500 *occasional class-room inspections each during the school year studied, besides about* 21,000 *individual inspections and over a thousand home visits each.* These room-inspections are especially valuable in poor, or foreign districts in bringing up the health and cleanliness standards towards that of civilized America. They are also valuable, as suggested, in the case of an impending epidemic.

c. Individual Inspections

Individual inspections are to be made principally by the nurse, but also, if necessary, by the physician in the one building he visits for two or more hours each day. Only *urgent* cases are to be referred either by nurse or teacher to the doctor. The principal classes of individual inspections are as follows:

w. Pupils referred at the time of the nurse's visit, by the teachers.

x. Pupils entering that school for the first time, any age.

y. Pupils who have been out of school for any reason more than three days, especially excluded, or quarantined cases.

z. Pupils brought to the attention of the nurse in the homes.

Where principals are, or become, qualified, a large number of the readmittance inspections may be left to them. The importance of the health training of principals and teachers and the books they can use in study, will be brought out later. A principal who hasn't such a knowledge of children (child-study) needs to "study up." He must, however, beware of cocksureness after little study.

The usual place for the individual inspections is at the health room or the principal's office. A bell is rung indicating the nurse's arrival. A school janitress or a good principal's clerk may be of great assistance in getting the children ready. Each child will come with his health record card in a fold of clean paper, and on this paper may be written the teacher's reason for sending in the pupil. He may be suspected of some ailment, or the teacher has noticed that he is not getting the treatment previously recommended, or for many other reasons, except as punishment. The nurse inspects the child, and, unless he is excluded, sends him back to his room, with a note to the teacher about the case on the same folder-protector of the card. The teacher may clip small memoranda slips on cards of pupils who have not yet obtained treatment, or put these cards in a special part of her file, or she may use the various colored clip-markers for card indexes, each color of which may be given a standard meaning, as before mentioned.

The *symptom chart* prepared by Dr. E. B. Hoag and printed in his "Health Index of Children," and separately, or some other set of indices to school ailments, such as are used in Cleveland, or printed by the writer in *American Education,* or those given by Dr. Wood in his "Health and Education," will be of great assistance to the teachers in locating the children needing referring to doctor or nurse.* Most of the present work of medical inspection is really *teacher*-inspection, since most of the cases are first noticed by the teachers and then sent in to the doctors. With all this responsibility the teachers have not been given a square deal in the way of health instruction in the form of lectures, clinics, teachers' meetings, or books, by which to fit themselves for their serious responsibility; and their normal or college courses have never, in most probability, even touched upon such matters. "The child," to their professional training institutions, was quite largely a disembodied mentality, and psychology was the only study of his nature.

2. *Environmental Inspections*

After *pupil* inspections, according to our outline, come environmental inspections. *Home visits,* or home hygiene inspection, by nurses is about their most important work, and the problem of *school sanitation* will soon come up in any thorough system of medical supervision. The home-hygiene inspections at the time of the nurse's home visits are becoming exceedingly valuable citizen-making institutions, and no words here can indicate the spirit, the possibilities or the methods of that humane and scientific work.

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*See also the bulletin of the U. S. Bureau of Education, No. 524, pp. 130-131.

We arrange for the records of such visits in cipher on each individual record card. Each nurse should obtain Dr. Hoag's or Dr. Cornell's book, and, at least, a book probably now published by the first school nurse of America, Miss Lina L. Rogers, R. N., now superintendent of school nurses at Toronto, and formerly of New York City. Dr. Dresslar's book on School Hygiene is also a desirable volume on the whole field. (Miss Rogers is now Mrs. L. R. Struthers.)

In certain small cities the experiment has been successfully tried of making the nurse the attendance officer also (thus saving another salary as related), so that she can go to a home and handle a case of truancy effectively, as any other school "case." The possibilities have not yet been half discovered in this whole field of home visiting. Even where there are attendance officers, the nurse becomes their most valuable assistant.

School sanitation inspection is more naturally the work of the superintendent, director of hygiene, principal and business manager; but the nurse and the physician should know enough about the subject from such texts as Shaw's or Dresslar's books on "School Hygiene," or the other books mentioned,* to do effective work in calling to their attention as often as is necessary evil conditions of lighting, cleaning, heating, ventilating, the condition of toilets, the necessity for play, playgrounds, and play apparatus, sanitary drinking fountains, the proper kind of dusting, and all such matters.

The Board of Health of Philadelphia has a special card form, for recording the facts of school sanitation, and Dr. Hoag has a portion of his book and a pamphlet devoted to a "Sanitary Survey of Schools," which is of great assist-

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*Dr. Jesse D. Burks and his wife have published a new book entitled "Health and the School," and the writer has one under way entitled "School Health," as well as a large volume by a large group of specialists entitled "Educational Hygiene" from kindergarten to university. The Burks' book is unique, being in dialogue form. Terman & Hoag will soon have out a valuable volume on "Health Work in the School." We need still more volumes—on School Clinics, on School Nursing, on Medical Supervision, etc.

ance to the amateur, and which can be had of Whitaker and Ray-Wiggin Co., San Francisco, or Paul Hoeber Co., 69 East 59th St., New York City.* Quite frequently the nurse or the school physician will observe unhealthful conditions not noticed by teachers or principals, and, then, may be even more successful than they in remedying these conditions. It depends upon who has the ability to translate private opinion into public opinion, and private scientific knowledge into public action.

C. Examinations.

There is no need of calling these *physical* examinations, except where the word examination is (badly) used for inspection. We have suggested that a thorough, routine room-inspection of children for all ailments of a serious character, recorded on the health record cards, is very much like an examination. It is, however, not so individual, so intensive, and so technically diagnostic. Inspections will frequently overlook decayed teeth entirely, and will never include routine vision or hearing tests, nor will they ever require, perhaps, the stripping of each child to the waist, as a matter of routine and without suspicion of some heart or lung ailment. An *examination* should be a patient, scientific, investigation of a child's health status, regardless of whether he is suspected of an ailment. Such examinations should not be painfully long, and impractical, however, in their minutiæ. Quick, accurate and thorough observation and judgment can be developed in this field as in any other. Much will depend upon the physician and the nurse and what they have in their minds as questions and problems regarding each child's health condition.

The examinations should be made in the health, or medical, room. This should be about half the size of an elementary school room (25 by 16), and be well lighted. It should have both hot and cold running water, a toilet adjacent, facilities for a combination tub and shower bath,

*See also the New Jersey form of 114 points in the U. S. Bulletin, No. 524, pp. 127-9.

a couch, several chairs, an ante-room for those awaiting examination, filing cabinets for case cards (for systems needing them), a table or desk or two with drawers, a medicine cabinet, a white enameled iron and glass stand, white enamel wash basins, and the various test cards, medicines, and the like, needed by nurse and physician. Types of equipment and supplies are given in a former chapter. Many schools add to these a platform scale, usually a "Jones," with height standard attached. Its necessity as a matter of general routine for all school children is yet to be demonstrated, however.

THE METHOD OF THE EXAMINATIONS

As suggested, it will probably be best for the nurse to be present each day during the two hours or more of the examination, so she can confer with the physician over cases and help in handling the children, making the vision and hearing tests, taking the records, etc., as can best be arranged. Scientific management in business does some of its best work with seemingly minor details of daily practice. There is great opportunity for the practice of its principles in medical supervision and especially in the examinations. This plan, however, must limit itself to bare essentials, in order not to exceed all space limits.

We have urged that the vision and hearing examinations, once a year or less often, as is found better, be given by the nurse and not by other persons; and that she do this, as much as possible, at the time the physician of her district makes his two-hour daily visit to some one school. One nurse will work with the physician at all times while the extra nurses will devote themselves to inspections and home visiting.

Here, at the ringing of the bell which indicates the physician's arrival, or before, children suspected of having serious ailments or who for some reason require immediate attention are sent by the teachers or nurse to the health room. At the same time, pupils of the lowest grades, a room at a time, are sent, by threes, to the health or medical (inspection) room. The nurse quickly inspects the serious cases, referring such as are puzzling to the doctor for further inspection, and then disposes of the first group. If desired, they may be *examined* at this time.

She then prepares, as may be necessary, a child (of the three mentioned) for the doctor's examination, calling his attention to any ailments or history of the child familiar to her and necessary for him to utilize, and begins, herself, to test the vision and hearing of another child. By the time the doctor is through with his medical examination she will perhaps be through with these two tests, and all can be recorded on the health record card of the pupil, exclusions can be made, or notices to parents regarding serious physical defects or other ailments signed. Each case (name of child) will be placed in her case book, or on a case-card on file in the health room or principal's office. Such cards for defective pupils are found necessary in many cities. The one used by Newark is sent to the "department of medical inspection," when the case is concluded. Cards not sent in by the end of the school term are used for follow-up work in the summer. Whenever a case is concluded, the teacher should be notified. The word "case" is frequently used to mean both a single child and all his ailments at any one time, and again each one of the ailments found, so that a child might be six or more cases at once. If the term is used (and it probably should not), it should refer only to *one child* with all of his ailments, whether one or many, at any one time. Usually every *new ailment* he gets will make another case. Then instead of recording the number of "cases," the number of different *ailments* should be given, and for a large group of children there will always be more ailments than pupils, probably, on the average, two or more to one.

The time of the examination should preferably be from nine to eleven each day, and each day in a different school during a week or longer, depending upon the number of schools it takes to supply about three thousand children, depending somewhat upon the locality, of course. Perhaps two thousand for the doctor and the same or fewer for the nurse may be found desirable in a poor, foreign district. For small schools the doctor's visits should be distributed over the year. A school with 200 pupils will mean about 10 visits, or one every three or four weeks. Compromises may be made here.

If the nurse and doctor go to the same school, how can we have inspection at other schools each day, someone may ask? This is one of the reasons for the extra nurse in the typical city. She will do this work. Otherwise, the principals and teachers must use their discretion as they have done for so long, until the nurse can come in the late morning or in the afternoon. Some of these daily inspection visits she can avoid by telephoning to a school and finding whether the teachers *have looked* and found any urgent cases. On schedule, she will probably get to one or two of these other schools each afternoon anyway.

THE VISION EXAMINATION

Whether vision and hearing tests should be made each year is a question. Abroad, all examinations are less frequent than here. A modification of the plan of Meriden, Connecticut, commends itself to our judgment, as a tentative hypothesis: that of tests for new children whenever they enter the school above the kindergarten, and every other year thereafter, i. e., the first, third, fifth, seventh, ninth, etc. The *three-year* interval there practiced would seem too long.

For the method of the examinations in detail, nurses and doctors should refer to some such book as that of Dr. W. S. Cornell (Health and Medical Inspection of School Children). Whipple's methods given in Monroe's Cyclopedia of Education under the topics, "Ear" and "Eye," are also commended. The methods given in Gulick and Ayres' Medical Inspection of Schools, are well chosen. With all their defects as complete tests, the Snelling's or other test types for capacity to read at twenty feet, and for astigmatism, must be, until we get better trained nurses and physicians for this work, our chief reliance. The apparatus recommended by Whipple consists of: a test card for acuity, a test card for astigmatism (preferably Verhoeff's chart), a simple trial frame into which may be fitted during the examination either one or two minus .75 *d* and one or two plus .75 *d* spherical lenses (48-inch focus, English system), and one blank disk. Probably better than the trial frame into which may be set the two types of lenses, are cheap spectacle frames fitted up, respectively, with the plus and minus glasses. These are for those, however, who have the interest to go forward and do accurate work, and will probably be used only where there is a director of hygiene. Another instrument, the retinoscope, the shape of a small paddle with a mirror and letters on its face, tests for three types of defects, and is good for quick general diagnosis for those who learn how to use it.

But just as important as the test, is the examination of the *general condition* of the pupil's eyes, whether inflamed, crossed, seemingly strained, whether the child has frequent headaches, how he holds his head, as well as the note by the teacher which she places on the paper in which each child carries his examination card.

Place the test card in a good light at a distance of twenty feet on the level with the pupil's eyes, and stand the child in such a way as to avoid any reflected glaring light. Children wearing glasses are to be tested with the glasses on, and if normal with them, so recorded. Pupils who, at twenty-foot distance, cannot read the line of letters marked twenty feet should not be counted defective (unless there are other signs of eye strain and ocular defect). Only those whose vision in either eye is 20/40 or less (each eye always tested separately and then, perhaps, both together) should be counted defective, with the exception mentioned. Testing with both eyes open has the advantage of showing what the best vision of the child is in ordinary circumstances, but also the disadvantage that it measures principally the vision of the stronger or better eye. As a check, it may be omitted as a routine matter, perhaps, and each child studied as a separate problem. If both eyes always varied together, mechanical methods, almost, might be employed. Unfortunately, the children strain and accommodate their eyes during the test. The best statement of the whole problem here is perhaps that given by the head of the vision department of the school clinic at Dunfermline, Scotland, in the 1911-12 report, distributed so freely by the Carnegie Trust of that place. The following pupils, as a general rule, should be referred as possibly defective and in need of the attention of an oculist:

a. All pupils showing signs of eyestrain, inflammation, headaches, etc.

b. All pupils with vision 20/40 or less in either or both eyes.

English and Scotch reports usually give the following in the report:

1. Number at different ages with "normal," 20/20, vision.
2. Number at different ages with "good," 20/30, vision.
3. Number at different ages with "fair," 20/40, vision.
4. Number at different ages with "bad," 20/60, vision.

The data by sexes are, also, frequently given, although probably unnecessarily. Most children are reported to parents who are 20/40 or less. The following for all the pupils of Dunfermline shows either an improvement in visual conditions, or *a change in methods* by the examiners, or both:

		1910.	1911-12.
Boys	20/40 or worse	6.4%	5.1%
Girls	20/40 or worse	12.5%	7.4%

The duty of the nurse is to get those books which will help her best, and also to obtain help from oculists, and to visit other school systems with good medical supervision systems. No plan can take the place of a live, inquiring, sympathetic intelligence.

HEARING TESTS

As the eyes were tested singly so is the hearing of each ear. The whisper test and the stop-watch tests will be of value. As with vision, the individuality of children is such that the best standard yet is common sense, *conservative* common sense in this matter. The tragus or projecting portion of the ear may be pressed easily into the cavity, and the stop-watch started and stopped and the child, not seeing it, asked if he hears it. What is asked may be whispered quite softly. Numbers and short sentences may be used. The standard may be an ordinary soft whisper at the distance of the vision tests, twenty feet, this probably being the greatest length of the room used. Only a very few children in each school will probably be found with this ailment, usually preceded by discharging ears.

All three or four of the children awaiting examination may be tested at once by standing them with their backs to the nurse and whispering commands, or asking that all who hear the stop-watch at various distances hold up their hands, etc. The difficulty of one pupil imitating another may easily be overcome. The growing experience of the nurse gives a norm or standard probably of more value than that of an audiometer, though the development of such objective standards should be encouraged in all this work. The observations of the teacher and parent as to the children's condition should always be sought as a help in examination.

Both examinations have taken less time, of course, than to read the lines here given in explanation of the work, probably two to five minutes for each pupil, making records and all.

THE DOCTOR'S MEDICAL EXAMINATION

The child having been tested for hearing and vision and the results, if below 20/40, placed on the record card for each eye, or, the numerical record for any degree of defect as may seem better, he passes on to the physician who gives him a thorough *medical* examination, loosening the clothing, removing the coat, or even stripping him as appears necessary for the best examination. The parents of twenty or more children have been notified of the approaching examination on this day and it is desirable that as many come as possible. If a parent is present, all the children of the family in that school should be examined on that morning.

The doctor looks, not for a few ailments, but for all on the code and report list. Some of the more easily missed ailments, he will give particular attention to, and especially those placed in the upper part of the list of physical defects. If a doctor finds few cases of enlarged glands one year and then later learns of their possible harm to the child in his school work, it has been found in our study that he will then begin to find many cases where he had not seen them before. What a man *is* so *sees* he, is the law of medical perception.

The doctor, especially, must be careful to calm the fears of the children and put them at their ease. It is all too customary a habit for children to remain out of school on the days when they know that the doctor is coming. Some teachers use the doctors as disciplinary bogeys, a great mistake. English school physicians may go about with silk hats and frock coats, but many of them carry a bag of candy ("sweets") of which to give to each child examined. One of them who has written a book on the work says it has many advantages. The attitude is the important thing.

As the doctor makes his examination he records any serious findings needing attention by parents and family physicians on the health record card. The system of signs makes it possible to do this very rapidly and with little waste of time. Here has been one of the greatest leaks, and almost as great as that of having the doctor travel about from school to school every morning on inspection tours, in many of the present systems of so-called "medical inspection."

Whenever a referable, non-infectious ailment is found in the examination or the inspections, the following note to parents may be filled out from the cards and inclosed in an envelope by the nurse, after the examination is over somewhere near eleven o'clock:

Medical Supervision of Schools,
Montclair, N. J.

NOTICE TO PARENTS OR GUARDIANS.

This notice does NOT exclude the pupil from school.

Date................................, 191..

The parent or guardian of.................................... is hereby informed that a physical examination by the school physician seems to show that this child is suffering from........................ .... You are advised to take this child to your family physician or a.....................specialist, for advice and treatment as soon as possible, in order that the pupil may be better fitted to do successfully and without injury his school work.

....
School Physician.

This notice may be placed on a card of a certain color, say yellow, and about $5\frac{1}{2}$ by $3\frac{1}{4}$ inches in size. Some send all such messages by post, but this is in most cases a needless waste.

On the back of the card may be printed a permit by the parent for the nurse to take the child to a clinic or physician for medical or surgical treatment, and an alternative statement that the parent has *had* a physician and the result of the visit, somewhat as follows :

PLEASE SEE THAT THIS CARD IS RETURNED TO THE TEACHER.

This pupil was seen by Dr..................................on ...., 19...., with the following result ....

Signature of parent or guardian,

....

I desire the school nurse to escort my child to.................. .... for medical or surgical treatment of the...........................

Signature of parent or guardian,

....

If the parent does not respond within three days, and an inspection at that time by the nurse shows no evidence of satisfactory treatment, another notice should be sent.

If this notice is not heeded, and it should be printed and worded in such a manner as to command attention and get results, the nurse may visit the home to help the parent see the need of the treatment or to explain and arrange with her the free treatment at some dispensary, the school clinic, or other similar place. If the nurse is unable to get the treatment, and cannot do it herself, the physician, principal or teacher may attempt the matter.

So many parents are so poor and so ignorant, and the provisions for treatment are so inadequate or unsatisfactory, that men and women in the school medical service are soon driven to see the absolute necessity of an adequate *school clinic,* with an oculist to make eye examinations and prescribe and, at times, furnish free glasses, dentists for dental service, and surgeons for operative work. The surgeons or the nurses attached, or a school physician, can make such treatments as are necessary—those for ringworm of the scalp with X-rays possibly, for favus, for trachoma, adenoids, tonsils, etc., and, with the help of the physical education division, such medical gymnastics as are needed for orthopedic, mouth breathing, and other cases. The need for an open-air school, and outdoor cooler ("uncooked") and moister air in the classrooms, will also soon be made manifest in even the best of cities.

As the examinations extend through the entire year, and the graduating class of February may not be reached by that time, it will be well to give this class an examination early in the term. Other children who may also be examined out of turn are: the children of a family when a parent has come to the examination, as suggested, children going into athletic contests (very important in some cities), children who are especially referred to the physician by the nurse, or to the nurse by the teacher, and children who have entered school, or *that* school, for the first time after the pupils of their rooms have been examined.

Not only parental visiting at the examinations is desirable but also school *consultations* with nurse or physician, when the parent has neglected treatment for the child, for instance. A notice such as the following may be sent, at the end of the three-day period mentioned:

DEPARTMENT OF MEDICAL SUPERVISION OF SCHOOLS.

Date................................, 19....

To the parent or guardian of..................................

Public School...........................

You were notified a few days ago that this child was found on examination by the school physician nurse to be in need of immediate treatment for..

Please call at the school at.......o'clock........................ to confer with the school physician nurse.

....

Principal.

Cross out either "physician" or "nurse" where they are printed for alternative use. This card may be white in color and 3¼ by 5½ inches in size. Other devices to obtain treatment will be invented by the thoughtful and interested nurse, physician, or principal. Some cities use attendance officers to force children in whom the doctor or nurse will not admit till treated or cured. Notice is also sometimes sent that parents are keeping children out *illegally,* even though excluded or referred for treatment.

When the time has come, three days after notification, and the pupil is in school, the teacher sends the pupil in for the nurse's or physician's inspection to see if the cure has been obtained. No record of cure or treatment is ever to be made without such inspection. The teacher's opinion is not enough. Dr. Foster, of Oakland, Cal., has his nurses record cures at the first routine inspection only, and these for ailments found the year previous. *Cures* take time.

A further attempt at accuracy, co-operation, and a check on the work of doctor and nurse, is the principal's monthly report based upon his own and the teachers records. This will be described later.

Great care must be taken not to give the impression that the nurse and physician are interested in providing patients for the doctors, dentists and oculists of the town. They are *not;* and one of the great reasons for the school clinic is to break down this argument not only of the medical fakirs so busy everywhere just now, but also the plain common-sense parents of the children. Dr. Chapin of the Providence Board of Health in his 1910 report and again in the one for 1911 has met a number of the criticisms of such free treatment, especially that it would injure the pocket-books of private medical people.

It is probable that if all the children of the nation were given free medical attention and treatment until the age of sixteen, as is almost the case now in Boston since the completion of the Forsythe Dental Clinic, and all children educated in right health habits and the necessity of getting the help of dentist and doctor where their services are necessary, the medical profession as a whole would lose but little, and the nation as a whole would be immeasurably improved. Free schools, free text-books, free libraries, free baths, free music in the parks, free postal service, free medical service for old and decrepit already: and why not free treatment where necessary, and rather generously, for the young and plastic, before they lose all their permanent teeth, perhaps, or the use of an eye, or the hearing of an ear? The bugaboo of "Socialism" hurled in 1828 at the speaker for *free schools* on the court house steps of Philadelphia leading to his arrest, and used so freely ever since, provokes no fright any more in the hearts of those who would minister to the health and happiness of this people. Selfishness will be swept into its deserved oblivion, before this advancing democracy and scientific brotherly love. Compulsory school attendance involves free and compulsory health provisions. These, when established, will point to certain necessary social reforms, of a far-reaching character, probably socialistic in tendency.

VACCINATION FOR SMALL POX

No one has yet proved that small pox vaccination is not necessary or desirable for all school children. Many cities are experimentally doing without such requirements in the schools, and the ailment does not seem to get a start in such towns. However, much experience points to its value even if the disease seems to be losing its virulence, and probably the best plan to enforce is that no child shall be admitted to the schools a day without such vaccination. Free vaccination should be provided by the schools or board of health for such purpose, and the work done by the nurse or physician. Re-inspection to observe the effect of the vaccine should be made as in the case of other treatments. Here the nurse will often find it necessary to make dressings for the vaccination sores. In Philadelphia, according to Burks, laxity in the prevention of small pox cost the city in 1891-2 through an epidemic over $21,000,000, and another outbreak in 1912 in Pennsylvania towns was only checked by wholesale vaccination.

EDUCATION OF THE PARENTS

For many or most of the fifty-four ailments and classes of ailments parents can be given judicious health instruction, as to treatment, reference to doctors and prevention. The book by Dr. Ditman on "Home Hygiene and the Prevention of Disease," by Duffield and Co., or one just as good or better, if any, should probably be in every intelligent household. Much of our recently discovered health knowledge has been the almost secret possession of the few. While there is some little danger in home treatment there is no danger in home *prevention,* and a book along the line of health education in the simple language of the people is necessary to democratize our health knowledge. This latter desire is also back of the simpler nomenclature used in the present system of medical supervision. An examination of the list of school ailments given in the 1910 or 1911 reports of the Boston Board of Health, and other such cities, will show what to avoid in this field.

Do you know, lay reader, what urticaria, verucca, furunculus, acne, tinea, scabies, pediculosis, and such names mean? They are respectively: hives, warts, boils, blackheads, ringworm, itch, and head lice. Such terminology for diseases thrown at parents is defended by saying that "it scares them into getting treatments." We say simply that these are the undemocratic methods of persons who do not know how, in the best way, to educate the people into independence and self-respect. Let schools using and adapting this system get close to the people and their needs and their problems, not high in the air above them, or behind some awesome word and mysterious profundity.

We shall not attempt here to describe all the good methods now being used by schools to reach the parents, or to devise an ideal and general plan. For brevity, only a list of some of the more interesting attempts, and where they can be found, will be listed:

1. The various colored prescription slips for a growing variety of ailments, to be found in Newark, Providence, New York City, and shown in "Medical Inspection of Schools," by Gulick and Ayres, new edition.

2. The dental charts showing the location of defective teeth, given out with defective teeth notices in many cities, one form given in the book mentioned; also the various pamphlets such as are given out by the Bath Trustees, City of Boston (on teeth), the Children's Aid Society of New York, the various pamphlets of Dr. E. B. Hoag of Berkeley, California; the prescriptions for getting compounded very cheaply serviceable tooth powder, by the Board of Health of New York City; the Newton, Mass., Board of Health pamphlet on "Information for the Family in Regard to Communicable Diseases," etc., etc.

3. The health lectures given by school nurses, doctors and principals, and outside specialists, often with the aid of the stereopticon. Newark records 346 such lectures in the school year of 1910-11.

4. The tuberculosis and other exhibits, stationary and portable.

5. The health budget exhibits showing the need for appropriations for medical supervision and other phases of educational hygiene.

6. Pamphlets on infant and child hygiene for parents.

7. Pamphlets on sex hygiene.

8. The remarkable variety of ways described in Elsa Denison's "Helping School Children," showing that "where-ever there is a will there is a way."

9. The constant and varied use of the newspapers for describing school health needs and what parents can do to help.

10. The annual health day or health week in the schools, as in Boston.

11. Above all, the splendid services of the wide-awake and resourceful school nurse going to the homes and helping the family in their struggles with the real health problems of life.

THE WEEKLY REPORT OF DOCTOR AND NURSE

Our nurse does all the general reporting. Any adequate report will always show in juxtaposition the ailments found by both doctor and nurse and what has been done with them, quite in contrast to most of the reports now given out to the public by school superintendents or directing physicians.

Some of the standards for such a report are:

a. It must be simple and take up as little time as possible and yet give the facts necessary for the proper education of the public, and the accurate recording and study of health data necessary for school health control.

b. It must show the ailments found *in detail,* if possible, and give the curative *results* obtained by the department.

c. It must record the work done by the different members of the corps and the time they spend in the school service.

d. It must use some standard classification and nomenclature of school ailments, not only for the uniformity necessary, and the ease of memorizing a relatively unchanging outline, but also for dividing the work naturally and emphasizing by position those ailments which play a large part in the success or failure of the pupil in school and life.

e. It must eliminate as much as possible the writing-in of the names of ailments. A great many reports print only names of ailments which occur with extreme rarity and the doctor and nurse must spend much time in writing-in many ailments or else neglect to report them. The result is commonly neglect, with large numbers of important ailments unreported.

f. The form should be such as will make possible a *balancing* of figures if possible, somewhat as the monthly reports of teachers and principals are made to balance. This is a difficult matter. Nurses must learn by study how to make out the report, just as they would learn to use any other instrument, say, a typewriter.

g. It must show the work by days, and by the week, and must record both *old* and *new* ailments, making it possible for the superintendent to know at any time of the year how many cases of uncured school ailments there are in the schools and, perhaps, in any school district. "Old" ailments are those found at any time during the year before the week reported. "New" ailments are those found during the week reported. Daily reporting may be used in large systems, but we are dealing with the more typical cities and rural districts.

h. It must show the number of new ailments found not only by the doctor but also by the nurse, their sum, the number to be subtracted because "negative," left the city, refused treatment, etc., and what happened to those left.

i. It must record exclusions, treatment by nurse or outside agencies, cures found by re-inspection, number readmitted, and the number "improved but not cured" in a case where cure is a matter of months or years.

j. The report will be not only an ailment report, but also a report of the number of examinations, home visits, inspections, pupils taken to the dispensary, etc. If possible, the nurse should report weekly the total number of various ailments to date that have been found, cured, and not cured, with perhaps the number treated and not treated.

This will greatly reduce the work at the central office.

k. The report should also give explicit directions as to the way to use it, and should interpret all terms to be used that are shifting in their meaning. All such directions should be printed on the report form itself, if possible.

l. It should also provide for a report on school sanitation, notes and recommendations, record of special cases, and any other data that cannot be given in figures and must be written out. The attempt to put every phase of reports dealing with such intimate and personal matters as these into the squares of report forms by a system of checks or figures easily makes for mere routine mechanics. We must have both the form and the spirit, the technically definite and the flexible.

Instead of printing the large 10x15 report here, we give the headings and other matter necessary to reproduce it.

THE FORM OF THE WEEKLY AND ANNUAL REPORT

We give above photographic reproductions of the headings of two sides of our tentative and suggestive weekly report. It can be modified as desired. The form is about ten by fifteen inches in size, and should be printed with black and red and with perhaps blue lines to make easily distinguishable the various divisions. The upper half of the face containing the name of the city is the general summary of work done: schools visited, time spent in the schools, etc. The lower half of the face page is divided vertically by a line continuing the line to the right of Wednesday or Thursday above. To the left of this line below should be printed specific numbered directions for making out the report such as appear below, while to the right below is the heading "General Notes to Supervisor of Hygiene," under which is to be written in any notes to supervisor, superintendent, or board of education on such matters as: special cases, recom-

Montclair, N.J. **MEDICAL INSPECTION** Weekending ______ 19 (Over)

Public Schools — General Summary — ______, M.D. ______ Nurse

			Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Totals	Remarks
Schools Visited Nos.		M.D.								
		Nurse								
Time Spent in Schools		M.D.								
		Nurse								
Number of Class-room Inspections		M.D.								
		Nurse								
Number of Individual Inspections		M.D.								
		Nurse								
Number of Pupils Examined		M.D.								
		Nurse								
Number of Pupils found Defective	New	M.D.								
		Nurse								
	Old	M.D.								
		Nurse								
Number of Ailments Found	New	M.D.								
		Nurse								
	Old	M.D.								
		Nurse								
Number of Ailments Treated		Nurse								
		Other								
Number of Ailments found		Cured								
		Improv'd								
Number of Pupils		Excluded								
		Readmitted								
		Unvaccinated								
		Vaccinated								
Number of Home Visits		M.D.?								
		Nurse								
No. Pupils Taken to Clinic, Dispensary, MD,		Dentist, or Oculist								
No. Deaths of Pupils		—								
Number of Health or Medical Talks or Lectures		M.D								
		Nurse								
		Others								
No. Pupils with Teeth Defects only										

TAILED REPORT OF AILMENTS

hool year. "Old" = ailments previously reported—before this week.

Mon.		Tues.		Wed		Thurs		Fri.		Satur.		Totals		Grand Total	Negative Sub-tract	Found by		Treated by		Found Cured		Found Improved		No. of Pupils		Grand Total of No. Ailments to Date		
Old	New	Old	New	Old	New	Old	New	Old	New	Old	New	Old	New			N	MD	N	MD	O	Old	New	Old	New	Excluded	Readmitted	Found	Cured	Not Cured

OVER

The above belongs with the other
two parts of the "detailed report
of ailments".
Size of report sheet,
about 10 by 15 inches
Use both sides.

Directions for Making the Weekly Report | General Notes to Supervisor of Hygiene

DE

"New" = first found in se

Number of Ailments met during the week by Doctor & Nurse

COMMUNICABLE AILMENTS	Physical Defects	1	Adenoids, Nasal Obst.
		2	Anemia
		3	Deafness, Hearing
		4	Dental, Teeth
		5	Enlarged Tonsils
		6	Eyesight, Vision
		7	Eyes Crossed, Strabis.
		8	Glands Enlarged, Aden.
		9	Heart Defects
		10	Lungs Weak, not Tub.
		11	Malnutrition, Debility
		12	Mentality Def.
		13	Nervousness, Chorea
		14	Palate Defects
		15	Skeleton, Orthoped.
		16	Spine, Curvature, etc.
		17	Speech Defects
		A	
		B	
		C	
	Ailments	18	Abscess, boils, etc.
		19	Acute Sore Throat, etc.
		20	Bronchitis
		21	Cleanliness needed
		22	Catarrh, rhinitis
		23	Colds, bad, Coryza
		24	Ear Discharge, Otitis
		25	Ears: minor
		26	Eczema
		27	Eyes: minor
		28	Headache, a symptom
		29	Laryngitis
		30	Nose bleed, Epistaxis

NON-	Common	31	Pharyngitis
		32	Rheumatism
		33	Sex Ailments
		34	Skin: minor
		35	Stomatitis
		36	Wounds, Sores, etc.
		37	Urinary, Enuresis
		D	
		E	
		F	
COMMUNICABLE AILMENTS	Minor & Parasitic	38	Conjunctivitis, pink E.
		39	Favus
		40	Impetigo
		41	Influenza
		42	Pediculosis, Lice
		43	Ringworm
		44	Scabies
		45	Tonsilitis
		G	
		H	
		I	
	Infectious Diseases	46	Chicken Pox
		47	Diphtheria
		48	Measles
		49	Mumps
		50	Scarlet Fever
		51	Trachoma
		52	Tuberculosis; Lungs
		53	Tuber. Other parts
		54	Whooping Cough
		J	
		K	
		L	
		M	
			Sum Totals

mendations, home hygiene, school sanitation, co-operation of outside agencies, special health needs of the schools, supplies desired, work of open air school, why certain cases are not treated, the chief difficulties, control of epidemics, personal stories of cases for the newspapers, etc., etc.

On the other side of the report sheet is the "Detailed Report of Ailments," the term ailments covering all affections of children of a pathological character. Vertically on the left are placed the 54 classes of ailments in four divisions with three or four lines left at the end of each division for writing in any special cases that cannot be placed in any of the above divisions. We give only the heading and the side, but the report may easily be duplicated in full by extending the lines. It looks formidable but nothing less, it seems, will keep before physicians and nurses the ailments they should look out for; will make easy the detailed recording of ailments; and will keep a definite unchanging order easily memorized by use. This report will be entirely made out by the nurse in red ink, on Saturday afternoons with the proviso that it is to be in the hands of the supervisor or superintendent by Monday at nine o'clock A.M. The chief weakness of the report is that it does not entirely separate the data by schools, although this will be done to a large extent where only five schools are visited each week by the medical examiner, Monday being very largely the cases found at one school. Records will, of course, be kept at each school for the year and these may be called in at the end of the year for the annual report. We are not trying here to provide a system for a large city like Philadelphia or even Newark or Boston, but for average cities, around twenty to a hundred thousand population. Dr. Burks has met the Philadelphia type of situation in his new book on Health and the School. The following directions may be printed on the report:

DIRECTIONS FOR MAKING THE WEEKLY REPORT

1. This report is to be made out by the nurse at the end of each day's service and summarized on Saturday afternoons for each week just passed.

2. It must be delivered at the office of the Supervisor of Hygiene or of the Superintendent of Schools by nine o'clock each Monday morning.

3. Every effort must be made to make it strictly accurate. No very minor unreferable ailments should be recorded—only those which need serious attention by the schools or the homes or both; and every reasonable effort should be made to have these ailments treated and cured.

4. The schools will be numbered in arabic numerals and should be so designated on the reports. (For small systems with few schools the names of the schools with their code numbers may be printed in the blank space or spaces at the top of the report under the words "General Summary.")

5. Time spent in the schools at medical work will be recorded in hours and decimal parts of hours—two hours and a half equalling 2.5 hours.

6. Room inspections should be recorded according to the number of rooms and not the number of pupils.

7. No pupils should be reported for more than one complete (physical) examination each year. All other physical studies of the pupils will be recorded as inspections.

8. New ailments are those found during the week reported; old, those previously reported.

9. Under number of ailments treated "other" or "O" refers to any agencies outside the schools that have treated the pupils.

10. Under "Remarks" any explanatory information may be written regarding the records to the left. Under "General Notes to Supervisor of Hygiene" any general reports, requisitions, special cases, recommendations, or the like, may be written in.

11. On the back of the report is the "Detailed Report of Ailments." Space is left for writing in the names of ailments not in the classification.

12. "Negative, Subtract" refers to ailments previously reported that have since been inspected by a family physician and declared "no case" or not serious enough to warrant treatment or operation. Pupils in any way leaving permanently the school system should also have their uncured ailments subtracted from the previous reports.

13. The "Grand Total of Number of Ailments to Date" is a brief summary of the year's work to date. In the "Not Cured" column should stand the exact number of ailments in the schools reported on that are not yet cured, so that the school officials may see at a glance just how many adenoid, impetigo, or diphtheria "cases" or ailments exist at the time among the school children.

14. All ailments of school children, especially the more serious ones, whether found in the schools or not should be here recorded. This applies particularly to "Infectious Diseases."

15. If there is an assistant, i. e., one besides the one who works daily with the physician, for this group of children, she should report her work to the first nurse who will incorporate the data in this report.

CLASSIFICATION AND FREQUENCY OF AILMENTS

We give below our classification of the ailments found in the twenty-five cities investigated with the probable number of these ailments which will be found in any one school year among a thousand elementary pupils, more in the lower grades than in the higher—although we have shown previously that, according to the Newark report of high school ailments, they are much the same and almost as frequent as for elementary pupils. The amount and kind of variation we are not yet ready to estimate.

Probably the most variable ailments in the list are the infectious; the frequencies given will for most cities merely indicate the number of actual ailments or carriers that will be found in the schools, and will not be large enough to give the medians for all the actual "cases" in the year. Yet all such cases, whether found in the school or not should be recorded. They cause absence and lowered vitality, and various physical defects such as weakened vision, defective hearing, etc., that are of much concern to the schools. A first-class system will also, through summer nurses and fall inspections, get records of all serious summer ailments of the children.

If each physician with one or two assisting nurses has three thousand pupils we can multiply these frequencies by three to see what the totals will be for the year. Very great variations should be investigated, but may be, of course, entirely normal for those pupils.

There are about 1,419 ailments for the thousand children if our estimates are anywhere near the true medians for average cities. Later investigations may make possible a statement of reasonable variations from these average figures, and may also show how they vary for different kinds of cities and for different kinds of districts within cities. We have not been able to get very satisfactory data on these problems. Poor and foreign families generally furnish most ailments, especially, perhaps, Russian Jews, South Italians, and Irish, although the native "poor white trash" seem to be in about the same group.

I. NON-COMMUNICABLE AILMENTS.

A. Physical Defects.	Probable No. Ailments per 1,000 El. Pupils
1. Adenoids, nasal obstruction, etc.	50
2. Anemia	10
3. Deafness, defective hearing	5
4. Dental, teeth	660
5. Enlarged tonsils	60
6. Eyesight, vision	70
7. Eyes crossed, strabismus, squint	7
8. Glands enlarged, adenitis	10
9. Heart defects	9
10. Lungs very weak, not tuberculosis	5
11. Malnutrition, debility, indigestion, general condition.	20
12. Mentality	10
13. Nervousness, chorea, habit spasm, nervous exhaustion	2
14. Palate defects	7
15. Skeleton, orthopedic defects (flat-foot, club-foot, etc.)	2
16. Spine: curvature, posture, round shoulders, etc.	8
17. Speech: stuttering, stammering, lisping, etc.	9
B. Common Ailments.	
18. Abscess, boils, etc.	5
19. Acute sore throat, cough, etc.	2
20. Bronchitis	1
21. Cleanliness needed	20
22. Catarrh, rhinitis	10
23. Colds, bad. Coryza	30
24. Ear discharge, otitis media	15
25. Ears: ear wax (impacted cerumen), foreign bodies, etc., Minor	5
26. Eczema	7
27. Eyes: "sore," blepharitis, styes, iritis, etc., Minor	20
28. Headache (a symptom), migraine, neuralgia	15
29. Laryngitis	5

30. Nose-bleed, epistaxis	2
31. Pharyngitis, chronic sore throat	3
32. Rheumatism	1
33. Sex ailments and habits	10
34. Skin ailments, minor; herpes, seborrhea, acne (blackheads), etc.	15
35. Stomatitis, mouth ulcers, "canker sores"	1
36. Wounds, sores, sprains, poison-ivy, chilblains, "first-aid," etc.	150
37. Urinary ailments, incontinence of urine, eneuresis	2

II. COMMUNICABLE AILMENTS.

A. Parasitic and Minor Infectious Ailments.

38. Conjunctivitis, "pink eye," etc	30
39. Favus, yellow scalp sores	1
40. Impetigo "contagioso," infectious sores	20
41. Influenza, grippe, infectious colds of a serious character	1
42. Pediculosis, head lice and vermin	50
43. Ringworm, body and scalp	4
44. Scabies, itch	5
45. Tonsilitis, quinsy	10

B. Infectious Diseases.

46. Chicken pox	6
47. Diphtheria	2
48. Measles	4
49. Mumps	4
50. Scarlet Fever	4
51. Trachoma, "granulated eye-lids"	1
52. Tuberculosis of the lungs, "consumption"	1
53. Tuberculosis of the bones and other parts of the body	1
54. Whooping Cough, Pertussis	2
Total	1,419

Roughly, I estimate that about one-third of the pupils will be found *free* from serious ailments (and defects), another third will be found with *teeth defects only*, and the final third with teeth defects and other ailments. This last third will average about three ailments each.

PRINCIPALS' MONTHLY REPORTS

On the regular monthly report of the principals to the superintendent there should be required a statement as to the general status of the medical service in each school with a statement as to the regularity, punctuality, and fulfillment of the time and schedule requirements of doctors and nurses. The report of principals in Trenton, N. J., is very suggestive but defeats itself by its elaborateness, calling for a report for each day of the month on several items and the list of ailments found, cured, etc., etc. This is the proper work for the school nurse and has been provided for in this plan. The principals should be made, however, to feel their responsibility for general oversight and leadership of all health measures in their schools and neighborhoods.

CASE CARD SYSTEM

The blue case cards used in Milwaukee and Newark and the one given in Dr. Cornell's book on Medical Inspection, page 57, are recommended for study and use, if they are found necessary. A book with appropriate headings on each page: room, date found, the ailment, recommendation, results, etc., for each school can more easily be carried, and has some advantages for a small system. See Cornell's Record of Defective Children, page 55. The exclusion books will also give the record of a number of cases. Each school should have its own exclusion-book as well as its own nurse's case book, or card index. The work must always be reported in terms both of the number of children and of the number of ailments.

THE WORK OF THE TEACHERS

Teachers and janitors, of course, should be examined prior to their entrance to the school system and every two to three, or fewer, years thereafter. It is remarkably easy for a tubercular teacher to get a clean bill of health from a physician, and the periodical examination should be made compulsory. Teachers as a class have more than their share of tubercular, nervous, and other ailments. That the teacher be in good health is a prerequisite to the proper health care of her pupils.

The teacher, also, must be educated for this health work as well as the doctors and nurses after they enter the system. A valuable medical-supervision library has developed in the past four years and each school system should provide its teachers with, at least, one simple well illustrated book on the subject, say Hoag's "Health Index" or Cornell's "Health and Medical Inspection of School Children," F. A. Davis Co., Philadelphia, as well as the other educative means discussed. Dresslar's "School Hygiene" (Macmillan) is very desirable for the whole health field. In the teachers' hands very largely must remain the health destines of the children, and this responsibility and this opportunity can never be entirely shifted.

SUPERINTENDENT'S ANNUAL REPORT ON MEDICAL INSPECTION

Much in the way of progress, records, and education of the public depends upon the character of this annual public report. The number of pages of the present reports devoted to this subject varies greatly even by percentages. South Manchester, Conn., probably gives a larger share of its report to these newer health matters than any other city. The plan of coming around to health matters every few years for intensive and comparative treatment while emphasizing certain general features every year is to be commended. Some of the features of the regular report may well be:

1. The summary of the weekly reports, which have been summarized for the newspapers and for each monthly board meeting during the year, both as to ailments and the general features given on both sides of the report.

2. Comparison with the work of former years.

3. Interpretation of the data presented.

4. Some of the interesting cases handled during the year, to give the intimate personal side, with photographs, if possible.

5. Emphasis on the percentage of ailments *cured.*

6. The principal needs and problems, and what parents can do to help.

7. Appreciative words for the various voluntary health agencies that have helped during the year, the newspapers. bequests for school clinics, etc. How the various divisions of the hygiene department have co-operated.

8. A general estimate of the health conditions of the school children.

III. MEASURING THE EFFICIENCY OF MEDICAL INSPECTION SYSTEMS

The principal efficiency tests are the percentage of the serious ailments existing in the school population that have been *found* and the percentage of the ailments found that have been *cured.* The decrease in ailments found from year to year due to prevention and curative measures (not to changes in the standards of inspectors) is a third essential factor. In another place (chapters on ailments, and in the table of ailment frequencies) the writer has given an estimate of the approximate percentages of serious ailments to be found in an ordinary school population at the present time with which comparisons may be made. Among a host of other tests of efficiency of this work are the following:

1. Number of physicians and nurses in proportion to the school population, and the number of nurses in relation to the number of physicians.

2. The qualifications and the character of the supervision of these officials.

3. The percentage of the school population inspected and examined, and the frequency of these.

4. The quality of the reporting system, whether it emphasizes essentials, and whether it promotes accurate records with minimum loss of time from other work.

5. The annual number of hours of work for physicians and nurses, and the regularity and punctuality of attendance upon such work.

6. The reasonable freedom from epidemics, closing of schools, deaths of school children, large amount of exclusion, quarantine, illness, absence and elimination, etc.

7. The quality of the methods of doctors and nurses to be determined by expert observation.

8. The amount of *state-aid* money obtained because of efficiency demonstrated to the State Supervisor of Hygiene.

REFERENCES

Some of the literature which will be of value in adapting this system to particular cities or rural regions, and the first four groups now procurable largely for the writing are:

1. 1911-12 report of the Chief Medical Officer, Dunfermline, Scotland.

2. Monograph bulletins on the medical inspection of school children in:

Board of Education Cities, such as Celveland, St. Louis, South Manchester, Conn. (1912 report), Milwaukee, Newark, Trenton, Yonkers, Toronto, Canada (Lina H. Rogers), Berkeley, San Jose and Oakland, California, College of The City of New York (Dr. Thos. Storey, on high school medical supervision), State Board of Education of Massachusetts, Boston, etc., Meriden, Conn.

Board of Health Cities, such as the New York, Chicago, Providence, State Board of Health, Connecticut; State Boards of Health of Virginia and Kansas (Health Almanacs), etc.

3. Annual Report of the Chief Medical Officer of the English Board of Education, London, England. This gives a list of good city and rural reports.

4. Annual Reports of the Chief Medical Officer for the London County Council, London, England.

5. Books: Monroe's "Cyclopedia of Education," five volumes. Health articles.

Gulick and Ayres, "Medical Inspection of School Children."

Cornell, "Health and the Medical Inspection of School Children."

Hoag, "The Health Index of Children."

Denison's "Helping School Children."

Wood: "Health and Education," and "The Nurse in Education," U. of Chicago Press.

Lina H. Rogers, "The School Nurse," soon to be published.

Burks "Health and the School," Appleton's.

Hutt, "Hygiene for Health Visitors, School Nurses, and Social Workers," P. S. King & Son, London, Eng.

Moll, "The Sexual Life of the Child."

Hutchinson's "Handbook of Health."

Ditman's "Home Hygiene and the Prevention of Disease."

Gillette, "Constructive Rural Sociology."

Kelynack, "Medical Examination of Schools and Scholars," King & Son, London, Eng.

Holmes, "The Conservation of the Child."

Dresslar, "School Hygiene."

Terman, "The Teacher's Health."

"Exercise in Education and Medicine," McKenzie, Saunders Co., Philadelphia.

Shaw, "School Hygiene."

Scripture, "Stuttering and Lisping."

"The Child in the City," by the Chicago School of Philanthropy.

Putnam, "School Janitors, Mothers and Health," American Academy of Medicine Press, Easton, Pa.

Marshall, "Mouth Hygiene."

Hoag and Terman, "Health Work in the Schools," in preparation.

Hutchinson, "Common Diseases."

Gulick, "Hygiene Series," Ginn & Co.

Ritchie, "Hygiene Series," World Book Co.

Colton, "The People's Health."

Holt, "Diseases of Infancy and Childhood."

McCombs, "Diseases of Children for Nurses."

Hoxie, "Practice of Medicine for Nurses."

"The Public Health Movement," *The Annals* for March, 1911.

Ditman, "Education in Preventive Medicine," Columbia University Press.

Wile, "Sex Education."

Woodworth, "The Care of the Body."

Hough and Sedgwick, "The Human Mechanism."

Rapeer, "Educational Hygiene" and "School Health," in preparation.

Lippert and Holmes, "When to Send for the Doctor."

Sandiford, "The Mental and Physical Life of Children," Longmans.

Sill, "The Child."

"Annotated Bibliography of Medical Inspection and Health Supervision of School Children in the United States for the years 1909-1912," a free bulletin (No. 524) by the U. S. Bureau of Education, Washington, D. C.

"A Bibliography on Educational Hygiene," by Thos. Wood and Mary Reesor, M. A., Teachers College, Columbia University, 1911.

"Annotated List of Text and Reference Books for the Training School for Nurses," prepared by the Department of Nursing and Health, Teachers College, Columbia University.

See also the biblography prepared by the author for his section on

"The Hygiene of the High School" in Johnston's "High School Education," Vol. II.

6. Bureaus: The Division of Child Hygiene, Sage Foundation, N. Y. City.

Bureau of Municipal Research, N. Y. City.

United States Bureau of Education.

Reports of the National Education Association, Educational Hygiene Articles.

The *Journal of the American Medical Association,* Chicago, reports on medical supervision.

Proceedings of the National and of the International School Hygiene Congresses.

7. Magazines: Current educational and other literature has many articles on these subjects, all of which can be found in any of the guides to periodical literature found in any public library.

*See also the bulletin of the U. S. Bureau of Education No. 524, pp. 130-131; and Dr. Dresslar's article on "Typical Health Teaching Agencies of the United States," in the report of the U. S. Commissioner of Education, Vol. I.

INDEX

INDEX

VITA

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Graduated and received the diploma in education from the Indiana State Normal School, Terre Haute, Indiana, in 1902; received the degree of Bachelor of Science from the University of Chicago in 1904; and the degree of Master of Arts from the University of Minnesota in 1907.

Was a teacher in the elementary schools of Indiana for five years, and later became principal of a high school for one year and a superintendent of schools for one year. For four years was a principal of elementary schools in Minneapolis. During the summer of 1908 was an instructor in the municipal playgrounds of Minneapolis, and the next summer was instructor in educational psychology and educational administration in the University of Minnesota. In 1909 became Assistant Professor of Education in the University of Washington, Seattle. In 1910 was a graduate scholar in Teachers College, Columbia University and an Assistant Tutor in Economics at the College of the City of New York. Since 1911 has been an assistant teacher in educational psychology, logic, and school management at the New York Training School for Teachers.